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(54) Presentation system for compression train configuration information

(57) A method and system for collecting operating conditions of a compression train from the potential purchaser, for presenting a compression train that satisfies those operating conditions, and for receiving a request for quotation for the presented compression train. The presentation system is implemented using a client/server architecture. The server system provides to the client systems display pages of compression train-related information. These display pages allow users of the client systems to input desired operating conditions of the compression train. When the server system receives these operating conditions from client systems, it provides these operating conditions to a calculation engine to identify a compression train that satisfies the operating conditions. The identified compression train includes the identification of the driver target, gearbox, and one or more compression casings along with various characteristics of the configuration such as discharge pressure, discharge temperature, and number of stages.

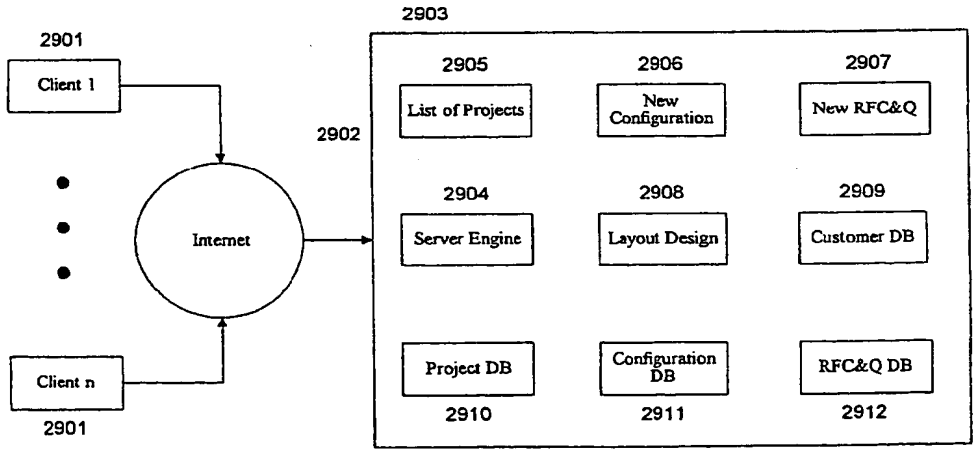

Fig. 29

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Description

[0001] The described technology generally relates to a user interface for accessing compression train configuration information.

[0002] It has traditionally been both time-consuming and expensive for purchasers of compression trains to identify the appropriate configuration for their power plants. These purchasers typically send their technical data in the form of a request for proposal via facsimile or electronic mail to a local sales representative of a seller of compression trains. This local sales representative in turn forwards that technical data to engineers who perform the technical selection of the configuration, prepare a detailed proposal, and forward the proposal to the local sales representative. The local sales representative then presents the proposal to the potential purchaser. The process from the receipt of a request for proposal by a local sales representative to the selecting and presenting of the proposal to the potential purchaser can take several weeks.

[0003] This process can take even longer when the technical data that is received from a potential purchaser is missing certain important data without which a selection cannot be made. In addition, the technical data supplied by the potential purchaser may be internally inconsistent and thus needs to be clarified before a proposal can be prepared. As a result, the engineers often need to ask the local sales representative to collect additional information from the potential purchaser, which further delays the selecting and presenting of the proposal.

[0004] Any delay in the selecting and presenting of a proposal is problematic. The first seller who provides a proposal for a project may have a competitive advantage over other sellers who provide their proposals a week or two later. Also, the potential purchaser's requirements may change frequently when the feasibility of the project is being evaluated. A seller who can rapidly respond to these changes in requirements will have an advantage over sellers who cannot.

[0005] It would be desirable to have a system that would allow potential purchasers to easily identify configurations of compression trains which will satisfy the operating conditions of their project, specify the scope of supply for the purchase of that configuration, and request a quotation for the purchase of the compression train with the specified scope of supply.

[0006] The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 illustrates the initial display page of the presentation system.

Figure 2 illustrates a display page with the list of currently defined projects for a user.

Figure 3 illustrates a display page with a list of configuration data sets for a project.

Figure 4 illustrates a display page for the results of a configuration data set when a request for quotation has already been sent to a seller.

Figure 5 illustrates a display page for the results of the configuration data set when a request for quotation has not been sent to a seller.

Figure 6 illustrates a display page for input of general data for a configuration data set.

Figure 7 illustrates the a display page for input of compression data for configuration data set.

Figure 8 illustrates a display page for input of fuel gas composition information.

Figure 9 illustrates a display page for input of processed gas composition information.

Figure 10 illustrates a display page for output of the configuration results.

Figure 11 illustrates a display page that display is more detailed configuration results data.

Figure 12 illustrates a display page for saving the configuration data set.

Figure 13 illustrates a display page for entry of general data for a new RFC&Q.

Figure 14 illustrates a display page for entry of compression related data for a new RFC&Q data set.

Figure 15 illustrates a display page showing summary data before saving the RFC&Q data.

Figure 16 illustrates a display page showing summary data after saving the RFC&Q data.

Figure 17 illustrates a display page showing the RFC&Q data that has been defined.

Figure 18 illustrates a display page with summary data for an RFC&Q for which no RFQ has been submitted.

Figure 19 illustrates a display page that lists verifications for RFC&Q data.

Figure 20 illustrates a display page for entry of a new verification.

Figure 21 illustrates a display page for entry of compression related verification data.

Figure 22 illustrates a display page for showing summary data for a verification.

Figure 23 illustrates a display page for specifying a layout design.

Figure 24 illustrates a display page for displaying the graphics of a layout.

Figure 25 illustrates a display page for an RFQ checklist for a compressor without the driver.

Figure 26 illustrates a display page for entry of an RFQ checklist with an electric motor.

Figure 27 illustrates a display page for entry of an RFQ checklist with a turbocompressor.

Figure 28 illustrates a display page for submitting an RFQ.

Figure 29 is a block diagram illustrating the components of the presentation system in one embodiment.

Figure 30 is a flow diagram illustrating the processing of the list of projects component in one embodiment.

Figure 31 is a flow diagram illustrating the processing of the new configuration component in one embodiment.

Figure 32 is a flow diagram illustrating the processing of the new RFC&Q component in one embodiment.

Figure 33 is a flow diagram of the list of RFC&Qs component in one embodiment.

Figure 34 is a flow diagram of the list of verifications component. In block 3401, the component retrieves the list of verifications for the user and displays and that list.

Figure 35 is a flow diagram illustrating the processing of the layout design component in one embodiment.

[0007] A method and system for collecting operating conditions of a compression train from the potential purchaser, for presenting a compression train that satisfies those operating conditions, and for receiving a request for quotation for the presented compression train is provided. In one embodiment, the presentation system is implemented using a client/server architecture. The client systems are computers that may be located at the site of potential purchasers, and the server system is a computer that may be under the control of the seller. The server system provides to the client systems display pages of compression train-related information. These display pages allow users of the client systems to input desired operating conditions of the compression train. When the server system receives these operating conditions from client systems, it provides these operating conditions to a calculation engine to identify a compression train that satisfies the operating conditions. The identified compression train includes the identification of the driver target, gearbox, and one or more compression casings along with various characteristics of the configuration such as discharge pressure, discharge temperature, and number of stages. The presentation system allows the user to submit requests for quotations to the seller for the identified compression train. If the calculation engine cannot identify a compression train that satisfies the operating characteristics, then the presentation system allows the user to submit the operating conditions (e.g., a configuration data set) to the seller so that the seller can manually identify a compression train that satisfies the operating conditions. The presentation system allows the user to define projects

which can group alternative configuration data sets for a compression train. The presentation system also allows the user to specify verification data, which can verify the selected compressor train. In this way, the presentation system allows a potential purchaser to quickly determine whether the seller has a compression train that satisfies the requirements and to submit a request for proposal at that time. Also, the presentation system ensures that sufficient information to prepare a proposal is collected initially and thus, avoids the delays associated with receiving incomplete or inconsistent data.

[0008] Figures 1-28 illustrate display pages of the presentation system in one embodiment. Figure 1 illustrates the initial display page of the presentation system. The presentation system displays the initial display page after a user has logged on to the presentation system. The display page 100 includes menubar 101 with the menu items of list of projects 102, new configuration 103, new RFC&Q 104, and layout design 105. The list of projects menu item displays display pages related to currently defined projects and the configuration data sets within each project. The new configuration menu item allows a user to define a new configuration data set. The new RFC&Q menu item allows a user to define and submit a request for configuration and quotation to the seller of the compression train. The layout design menu item allows a user to design a layout for a proposed compression train and then view that layout.

[0009] Figures 2-5 illustrate the display pages related to the list of projects menu item. Figure 2 illustrates a display page with the list of currently defined projects for a user. Display page 200 includes menubar 201 and list of projects 202. Each project 203 includes a title, date, project description, rfq icon and selection radio button. The rfq icon indicates whether a request for quote has been sent. The selection radio button is used to select a project for further processing. The date indicates the day in which the project was created. The open button 204 is used to open a selected project. The rename button 205 and the delete button 206 are used to rename and delete the selected project. Figure 3 illustrates a display page with a list of configuration data sets for a project. Display page 300 is displayed when the open button 204 is selected. Display page 300 includes menubar 301, configuration data set listing 302, and project title 303. The configuration data set listing contains entry 304 for each configuration data set that is defined for the project. Each configuration data set entry includes a selection radio button, a configuration name, a creation date, an indication of the proposed composition of the compression train, a checklist button 304, a data sheet button 305, and request for quote button 306. The checklist button is used to display the checklist associated with the configuration data set. The checklist includes additional information needed to specify the scope of a request for quotation. The data sheet includes data for the proposed configuration. The request for quote button is used to submit a request for quotation based on the configuration data. The date field associated with the request for quotation indicates the date in which a request was submitted to the seller. The open button 307 is used to open the selected configuration data set. The rename button 308 and the delete button 309 are used to rename and delete the selected configuration data set.

[0010] Figure 4 illustrates a display page for the results of a configuration data set when a request for quotation has already been sent to a seller. Display page 400 includes menubar 401, configuration data set identification area 402, and configuration results area 403. The configuration results area includes proposed configuration 404 and configuration characteristics 405. The proposed configuration indicates a driver target, gearbox, and one or more composition casings associated with the various stages of the proposed compression train. The configuration characteristics include discharge pressure, discharge temperature, number of stages, actual discharge flow, power margin, and absorbed power at drive shaft. The modify button 407 is used to modify the configuration data set using the display page of Figure 6. The more data button 408 is used to display more detailed information about the configuration data set as illustrated by Figure 11. The layout composition button 409 is used to display a layout for the proposed configuration in PDF form. The view list of configurations button 410 is used to list the configurations associated with the project as indicated by Figure 3. Figure 5 illustrates a display page for the results of the configuration data set when a request for quotation has not been sent to a seller. This figure is similar to Figure 4.

[0011] Figures 6-12 illustrate display pages relating to the creating of a new configuration data set. Figure 6 illustrates a display page for input of general data for a configuration data set. Display page 600 includes menubar 601, plant general data area 602, environment conditions area 603, driver specifications area 604, and next button 605. The plant general data area includes the units for the data and an indication of the compression service. The environment conditions area includes environmental design pressure, design temperature, and relative humidity. The driver specifications area includes the driver type, model, gas turbine data, electrical frequency and compressor speed. The gas turbine data includes fuel type. The next button is used to display the next display page for input of the configuration data. The following tables specify the contents of the fields of Figure 6.

PLANT GENERAL DATA			
Name	Category	Valid Values List	Length/Type
Unit System	Input field	SI; U.S. system	CH*2 string,

(continued)

PLANT GENERAL DATA			
Name	Category	Valid Values List	Length/Type
Compression Service	Input filed	Gas Lift; Gas Processing & Recompression; Gas Reinjection; High Pressure Pipeline; Fuel Gas; Other; Not specified	CH*8 string, left justified

ENVIRONMENT CONDITIONS			
Name	Category	Valid Values List	Length/Type
	Input field	Asl; Environment Pressure	CH*4 string, left justified
Environmental Design Pressure	Input field	0:2500 SI 0:8200 U.S. system	CH*10 string, integer
Design Pressure	Input field	0.87:1.3 SI 12.61:18.5 U.S. system	CH*10 string, numerical
Design Temperature	Input field	-50: 60 SI -58:140 U.S. system	CH*10 string, numerical
Relative Humidity	Input field	0:100	CH*10 string, numerical

DRIVER SPECIFICATION			
Name	Category	Valid Values List	Length/Type
Driver type	Input field	Optimized Optimized Electric Motor Gas Turbine Asynchronous Electric Motor Synchronous Electric Motor None	CH*3 string
Model (GST only)	Input field	Optimized; PGT5; PGT10; GE10/2; GE16; LM2500; LM2500+ HSPT; FRAME 5C; FRAME 5D	CH*8 string, left justified
Model (AEM only)	Input field	Optimized; 1250; 2250; 5500; 7000; 8000; 12000;	CH*5 string, left justified

(continued)

DRIVER SPECIFICATION			
Name	Category	Valid Values List	Length/Type
Model (SEM only)	Input field	Optimized; 7000; 8000; 12000; 16000; 20000;	CH*5 string, left justified
Fuel Type (GST, OPD only)	Input field	Process gas Not specification Natural gas Given heat value Given Fuel gas	CH*3 string
Electrical Frequency	Input field	50 60	CH*2 string
Compressor Speed	Input field	3000:20000	CH*10 string

[0012] Figure 7 illustrates a display page for input of compression data for a configuration data set. Display page 700 includes menubar 701, compression data area 702, compressor options area 703, interstage data area 704, and calculate button 705. The compression data area includes gas state equation selection, suction pressure, suction temperature, and processed gas composition selection button 706. The compressor options include number of stages, casing type information, and casing model and size information. The interstage data includes gas cooler discharge temperature, interstage pressure drop information, and interstage discharge pressures. The calculate button is used to submit the configuration data set to the calculation engine for identifying a compression train configuration that satisfies the configuration data set. The following tables further specify the contents of the fields of Figure 7.

COMPRESSION DATA			
Name	Category	Valid Values List	Length/Type
Gas State Equation	Input field	Optimized; BWR-Starling; Lee-Kesler	CH*3 string
Nace Application	Input field	Yes; Not	CH*4 string
Fuel Gas (FGS only)	Input field	Button	N/A
Fuel mole weight (NGS only)	Input field	>0	CH*6 string, numerical
Fuel low heat value (LHV only)	Input field	>0	CH*6 string, numerical
Process Gas	Input field	Button	N/A
Handled Flow	Input field	Mass Flow; Volume Flow; Normal Flow (@1atm, 0°C with SI only); Standard Flow (@14.7psia, 60°F with U. S only)	CH*3 string
	Input field	>0	CH*10 string, numerical
Suction Pressure	Input field	0:540 SI 0:7830 U.S. system	CH*10 string, numerical
Suction Temperature	Input field	-50:170 SI -58:338 U.S. system	CH*10 string, numerical

(continued)

COMPRESSION DATA			
Name	Category	Valid Values List	Length/Type
Discharge Pressure	Input field	0:540 SI 0:7830 U.S. system	CH*10 string, numerical
Max Temperature	Input field	170 SI 338 U.S. system	CH*10 string, numerical

COMPRESSOR OPTIONS			
Name	Category	Valid Values List	Length/Type
Stage Number	Input field	Optimized; 1,2,3,4	CH*1 string, numerical
Casing Type (according to impellers arrangement)			
Horizontally Split	Input field	Yes; Not	CH*3 string
Back-to-Back (not for Stage Number = 1)	Input field	Yes; Not	CH*3 string
Double Flow	Input field	Yes; Not	CH*3 string
Max Peripheral Speed of Impellers If Nace Application = No If Nace Application = Yes	Input field	 280 SI 918 U.S.system 250 SI 821 U.S. system	CH*10 string, numerical
Stages ompression Ratio as % of 1st Stage Compression Ratio (for the indicated number of stages)			
2nd Stage	Input field	N/A	CH*10 string, numerical
3rd Stage	Input field	N/A	CH*10 string, numerical
4th Stage	Input field	N/A	CH*10 string, numerical
Casing Model and Size (for the "actual" number of casing)			
1st Casing Model	Input field	Optimized MCL 2MCL DMCL BCL 2BCL DBCL	CH*4 string, right justified
1st Casing Size (MCL types)	Input field	Optimized 350 450 500 600 800 1000 1400 1800	CH*4 string, left justified

INTERSTAGE DATA			
Name	Category	Valid Values List	Length/Type
Gas Cooler Discharge Temperature	Input field	55 SI 131 U.S. system	CH*10 string, numerical
Max Stage Suction Temperature	Input field	120 SI 348 U.S. system	CH*10 string, numerical
Interstage Pressure Drop as % of Inlet Pressure (only for the indicated number of stages)			
Between 1st & 2nd Stages	Input field	2.5	CH*10 string, numerical
Between 2nd & 3rd Stages	Input field	2.5	CH*10 string, numerical
Between 3rd & 4th Stages	Input field	2.5	CH*10 string, numerical
Interstage Discharge Pressures (only for the indicated number of stages)			
1st Stage	Input field	N/A	CH*10 string, numerical
2nd Stage	Input field	N/A	CH*10 string, numerical
3rd Stage	Input field	N/A	CH*10 string, numerical

[0013] Figure 8 illustrates a display page for input of fuel gas composition information. Display page 800 includes menubar 801, water content area 802, gas composition information area 803, and confirm button 804. The water content area includes reference humidity, reference temperature, water, and reference pressure. The gas composition information indicates each gas component, quantity, and type of measures. The confirm button is used to confirm that the information entered is correct and return to the display page of Figure 6. Figure 9 illustrates a display page for input of processed gas composition information. This display page is similar to the display page represented by Figure 8. The following tables further illustrate the contents of Figures 8 and 9.

WATER CONTENT DATA			
Name	Valid Values List	Category	Length/Type
Reference humidity	0:100	Input field	CH*10 string, numerical
Reference temperature	-50:170 SI -58:338 U.S. system	Input field	CH*10 string, numerical
Reference pressure	0:500 SI 0:7250 U.S. system	Input field	CH*10 string, numerical
Water	%	Input field	CH*10 string, numerical

GAS COMPOSITION DATA			
Name	Valid Values List	Category	Length/Type
Component Name	Methane Ethane Propane normal Butane iso Butane normal Pentane iso Pentane neo Pentane normal Hexane methyl Pentane 2 methyl Pentane 3 dimethyl Butane 2,2 dimethyl Butane 2,3 normal Heptane normal Octane Ethylene Propylene Gas Name 1-Butene cis 2-Butene trans 2-Butene iso Butene Air (as pure component) Helium Argon Hydrogen Nitrogen Oxygen Hydrogen Sulfide Carbon Monoxide Carbon Dioxide Sulfur Dioxide Nitric Oxide	Input field	CH*4 string, left justified
Quantity	%	Input field	CH*10 string, numerical
Type of measures	Mole; Weight	Input field	CH*10 string, numerical

[0014] Figure 10 illustrates a display page for output of the configuration results. Display page 1000 includes menubar 1001, configuration data set identification area 1002, and configuration results area 1003. The save button 1006 is used to save a configuration and return to the display page of Figure 12. The modify button 1007 is used to modify a configuration and return to the display page of Figure 7. The more data button 1008 is used to display more detailed information about the configuration data set as illustrated by Figure 11. The layout composition button 1009 is used to display a layout for the proposed configuration in PDF form. This display page is similar to the display page of Figure 5.

[0015] Figure 11 illustrates a display page that displays more detailed configuration results data. Display page 1100 includes menubar 1101, driver data area 1103, compression data area 1104, casing data area 1105, and back button 1106. The following tables further illustrate the field of display page 1100.

DRIVER DATA			
Name	Category	Valid Values List	Length/Type
Discharge Pressure	Output field	decimal >0	CH*10 numerical

(continued)

DRIVER DATA			
Name	Category	Valid Values List	Length/Type
Driver Model (Driver Target)	Output field		CH*12 string
Actual Discharge Flow	Output field		As input
Absorbed Power at Driver shaft (all losses included)	Output field	decimal >0	CH*10 numerical
Power Margin (referred to Absorbed Power at Driver)	Output field	decimal	CH*10 numerical
Electrical Frequency (only if electric motor)	Output field		

COMPRESSION DATA			
Name	Category	Valid Values List	Length/Type
Molecular Weight (Inlet Mole Weight)	Output field	decimal >0	CH*10 numerical
Handled Flow Type	Output field	decimal >0	CH*10 numerical
Stage Conditions (i=1:4 is the stage number)			
Suction Pressure	Output field	decimal >0	CH*10 numerical
Suction Temperature	Output field	decimal	CH*10 numerical
Suction Actual Flow	Output field	decimal >0	CH*10 numerical
Discharge Pressure	Output field	decimal >0	CH*10 numerical
Discharge Temperature	Output field	decimal	CH*10 numerical
Discharge Actual Flow	Output field	decimal >0	CH*10 numerical
Impellers Number	Output field	1:9	CH*2 numerical
Speed	Output field	decimal >0	CH*10 numerical
Politropic Efficiency	Output field	decimal 0:100	CH*10 numerical
Casings (i=1:3 is the casing number)			
Model	Output field	N/A	CHA*4 string
Size	Output field	N/A	CHA*4 string
Rating	Output field	N/A	CHA*5 numerical
Type	Output field	N/A	CHA*2
Impellers Number	Output field	decimal >0	CH*2 numerical

[0016] Figure 12 illustrates a display page for saving the configuration data set. Display page 1200 includes menubar 1201, project identification area 1202, configuration data set identification area 1203, and OK button 1204. The user inputs the name of an existing or new project and the name of an existing or new configuration data set and selects the OK button to save the configuration data set.

[0017] Figures 13-16 illustrate display pages for entry of a new RFC&Q data set. Figure 13 illustrates a display page for entry of general data for a new RFC&Q. Display page 1300 includes menubar 1301, plant general data area 1302, environment conditions area 1303, and driver specifications area 1304. The web page also includes the next button 1306. This display page is analogous to the display page of Figure 6 for entry of new configuration data. Figure 14 illustrates a display page for entry of compression related data for a new RFC&Q data set. Display page 1400 includes menubar 1401, compression data area 1402, compressor options data area 1404, and interstage data area 1405. The compression data area includes processed gas composition selection button 1403. The display page also includes next button 1406. This display page is analogous to the display page of Figure 7 for entry of new configuration data. Figure 15 illustrates a display page that shows summary data before saving the RFC&Q data. Display page 1500 includes menubar 1501, RFC&Q identification area 1502, general data area 1503, and compression data area 1504.

The display page also includes save button 1505 and modify button 1506. The modify button is used to modify the RFC&Q data using the display page of Figure 13. Figure 16 illustrates a display page showing summary data after saving the RFC&Q data. Display page 1600 is similar to display page 1500 except that the RFC button 1606 and the view list of RFC&Q button 1608 are provided.

[0018] Figures 17-18 illustrate display pages for viewing RFC&Q data. Figure 17 illustrates a display page showing the RFC&Q data that has been defined. Display page 1700 includes menubar 1701, project title area 1702, list of RFC&Q data area 1703, and RFC&Q data entry 1704. This display page is similar to the display page of Figure 3 for configuration data sets. Figure 18 illustrates a display page with summary data for an RFC&Q data set for which no RFQ has been submitted. Display page 1800 is similar to display page 1600.

[0019] Figures 19-22 illustrate display pages related to verification of RFQs. Figure 19 illustrates a display page that lists verifications for RFC&Q data. Display page 1900 includes menubar 1901, RFC&Q identification area 1902, verification list 1903, and verification entry 1904. Each of the verification entries includes a selection radio button, verification name, creation date, and description area. The display page also includes an open button 1905, rename button 1906, delete button 1907, new verification button 1908, RFQ button 1909, and view list of RFC&Qs button 1910. The open button allows a user to view and modify the data associated with the selected verification. The rename and delete buttons are used to rename or delete the selected verification. The new verification button is used to define a new verification. The RFQ button is used to submit a request for quotation for all the verifications, and the view list of RFC&Q button is used to display the list as indicated by the Figure 17. Figure 20 illustrates a display page for entry of a new verification. Display page 2000 includes menubar 2001, plant general data area 2002, environment conditions area 2003, and driver specifications area 2004. This display page is similar to the display page of Figure 6 for entry of configuration data. Figure 21 illustrates a display page for entry of compression related verification data. Display page 2100 is similar to display page 700 for entry of configuration data. Figure 22 illustrates the display page for showing summary data for a verification. Display page 2200 is similar to display page 800 for configuration data.

[0020] Figure 23 illustrates a display page for specifying a layout design. Display page 2300 includes menubar 2301, project data area 2302, driver specifications area 2303, and compressor casings area 2304. This display page is used to define the layout for the proposed compression train. The user selects the driver specifications and compressor casings for the configuration. When a user selects the design button 2305 to view a PDF form of the layout. Figure 24 illustrates a display page displaying a PDF form of the layout.

[0021] Figures 25-27 illustrate display pages for entry of additional information for a checklist associated with an RFQ. Figure 25 illustrates display page for an RFQ checklist for a compressor without the driver. Figure 26 illustrates a display page for entry of an RFQ checklist with an electric motor. Figure 27 illustrates a display page for entry of an RFQ checklist with a turbocompressor. Figure 28 illustrates a display page for submitting an RFQ. Display page 2800 includes menubar 2801, configuration identification area 2802, and additional information area 2803. The user selects the send request button 2806 to send the request to the seller. The user selects the view checklist button 2804 to view the checklist associated with the RFQ. The user selects the view data sheet button 2805 to view the data sheet associated with the RFQ. The user selects the view configuration results button 2807 to view the results of the configuration.

[0022] Figure 29 is a block diagram illustrating the components of the presentation system in one embodiment. The presentation system includes client computers 2901 and server computer 2903 that are interconnected via the Internet 2902. The computers may include a central processing unit, memory unit, input devices (e.g., keyboard and pointing devices), output devices (e.g., display devices), and storage devices (e.g., disk drives). The memory and storage devices are computer-readable media that may contain instructions that implement the presentation system. In addition, the data structures and message structures may be stored or transmitted via data transmission media such as a signal on a communications link. Communication channels other than the Internet may be used, such as local area network, wide area networks, or point-to-point dial-up connections. The client computers may include a standard web browser for viewing display pages (e.g., web pages) provided by the server system. In one embodiment, the server system includes a server engine 2904, list of projects component 2905, new configuration component 2906, new RFC&Q component 2907, layout design component 2908, customer database 2909, project database 2910, configuration database 2911, and RFC&Q database 2912. The server engine receives requests for display pages from the client computers, invokes the appropriate components of the presentation system, and sends the display pages generated by the invoked components to the client computers. The list of project component controls the creation and management of projects for the presentation system. This component is invoked when the list of projects menu item is selected. The new configuration component controls the creation of new configuration data sets. This component is invoked when the new configuration menu item is selected. The new RFC&Q component creates a new request for configuration and quotation data sets. This component is invoked when the user selects the new RFC&Q menu item. The layout design component controls the creating of a layout design. The layout design component is invoked when the user selects the layout design menu item. The various databases contain information defining authorized customers, defined projects, defined configuration data sets, and defined RFC&Q data sets.

[0023] Figure 30 is a flow diagram illustrating the processing of the list of projects component in one embodiment.

In block 3001, the component retrieves the list of projects defined for the user from the project database and displays that list to the user. In decision block 3002, if the user selects the rename or delete button, then the component continues at block 3003. In block 3003, the component controls the renaming or deleting of the selected project and then the loops to block 3001 to display the list of projects. In decision block 3002, if the user selects the open button, then the component continues at block 3004. In block 3004, the component retrieves the list of configurations defined in the configuration database for the selected project. In decision block 3005, if the user selects the rename or delete button, then the component continues at block 3006. In block 3006, the component renames or deletes the selected configuration data set and loops to block 3004 to display the list of configuration data sets. In decision block 3005, if the user indicates to list the RFC&Qs, then the component continues at block 3007 to list the RFC&Qs for the selected project. In decision block 3005, if the user selects the open button, then the component continues at block 3008. In decision block 3008, if an RFQ has been sent for the selected configuration data set, then the component continues with the appropriate processing as indicated by the ellipses, else the component continues at block 3009. In block 3009, the component displays the summary data for the selected configuration data set. In decision block 3010, if the user selects more data, then the component displays more detailed information about the configuration results in block 3011 and continues at block 3009. In decision block 3010, if the user selects to design the layout information, then the component continues to display the layout design in PDF form 3012. In decision block 3010, if the user selects the new configuration button, the component invokes the new configuration component in block 3013. In decision block 3010, if the user selects to send a request for quotation, then the component sends the request for quotation in block 3014.

[0024] Figure 31 is a flow diagram illustrating the processing of the new configuration component in one embodiment. In block 3101, the component inputs the general configuration data for a new configuration data set. If the user selects the next button, then the component continues at block 3104. In block 3104, the component inputs the compression data for the configuration data set. In decision block 3105, if the user selects the fuel gas button (only when this button is displayed), then the component inputs the fuel gas data composition data in block 3103 and loops to block 3104. In decision block 3105, if the user selects the process gas button, then the component continues at block 3106 to input the process gas composition data and loops to block 3104. In decision block 3105, if the user selects the calculate button, then the component continues at block 3107. In block 3107, the component identifies a compression train that satisfies the new configuration data set. In decision block 3108, if a compression train was identified that satisfies the configuration data set, then the component continues at block 3111, else the component continues at block 3109. In block 3109, the component displays an error. In decision block 3110, if the user indicates to go back to the input display page, then the component continues at block 3101, else the component continues to allow the user to submit an RFC&Q. In block 3111, the component displays the configuration results. In decision block 3112, if the user selects the more data button, then the component displays the more detailed configuration results data in block 3113 and continues at block 3111. In decision block 3112, if the user selects the layout design button, then the component invokes the layout design PDF form. In decision block 3112, if the user selects the save button, then the component saves the project in block 3115 and continues at block 3111. In decision block 3112, if the user selects the modify button, then the component loops to block 3101 to modify the configuration data.

[0025] Figure 32 is a flow diagram illustrating the processing of the new RFC&Q component in one embodiment. In block 3201, the component inputs the general RFC&Q data for the data set. If the user selects the next button, then the component continues at block 3204. In block 3204, the component inputs the RFC&Q compression data. In decision block 3205, if the user selects the fuel gas button (only when this button is displayed), then the component inputs the fuel gas composition data in block 3203 and loops to block 3204. In decision block 3205, if the user selects the process gas button, the component inputs the process gas composition data in block 3206 and loops to block 3204. In decision block 3205, if the user selects the next button, then the component continues at block 3207. In block 3207, the component displays the summary before saving data for the RFC&Q data. In decision block 3208, if the user selects the save button, then the component continues at block 3209. In block 3209, the component displays the summary after saving data. In decision block 3210, if the user selects the RFQ button, then the component sends an RFQ to the seller in block 3211 and continues at block 3207. In decision block 3210, if the user selects the list of verification button, then the component invokes the list of verifications component in block 3212. In decision block 3210, if the user selects the view list of RFC&Q button, then the component invokes the list of RFC&Q component in block 3213. In decision block 3210, if the user selects the modify button, the component continues at block 3201.

[0026] Figure 33 is a flow diagram of the list of RFC&Qs component in one embodiment. In block 3301, the component retrieves and displays the list of RFC&Qs for the user. In decision block 3302, if the user selects the rename or delete button, then the component renames or deletes the selected RFC&Q and continues at block 3301. In decision block 3302, if the user selects the list of configuration button, then the component invokes the list of configuration component in block 3304. In decision block 3302, if the user selects the open button, then the component continues at block 3305. In block 3305, if an RFQ has been sent for the selected RFC&Q data set, the component continues at the ellipses, else the component continues at block 3306. In block 3306, the component displays the RFC&Q summary data for the selected RFC&Q data set. In decision block 3307, if the user selects the list of RFC&Qs, then the component continues

at block 3301. In decision block 3307, if the user selects the RFQ button, then the component sends the RFQ in block 3308 and loops to block 3301. In decision block 3307, if the user selects the list of verification button, then the component invokes the list of verification component in block 3309. In decision block 3307, the user selects the new RFC&Q button, then the component invokes the new RFC&Q component in block 3310. In decision block 3307, if the user selects the rename button, then the component renames the RFC&Q data set in block 3311 and then continues at block 3306.

[0027] Figure 34 is a flow diagram of the list of verifications component. In block 3401, the component retrieves the list of verifications for the user and displays that list. In decision block 3402, if the user selects the rename or delete button, then the component renames or deletes the selected verification block 3404 and continues at block 3401. In decision block 3402, if the user selects the RFQ button, then the component sends the RFQ for the selected verification in block 3405. In decision block 3402, if the user selects the list of RFC&Qs button, then the component invokes the list of RFC&Qs component in block 3403. In decision block 3402, if the user selects the new verification button, then the component continues at block 3406. In block 3406, the component inputs the general data for a verification data set. In decision block 3407, if the user selects the fuel gas button, then the component inputs the fuel gas composition in block 3408 and continues at block 3406. In decision block 3407, if the user selects the next button, then the component continues at block 3409. In block 3409, the component inputs the verification compression data. In decision block 3410, if the user selects the process gas button, then the component inputs the process gas composition in block 3411 and continues at block 3409. In decision block 3410, if the user selects the next button, then the component continues at block 3412. In block 3412, the component displays the verification summary data. In decision block 3413, if the user selects the modify button, then the component continues at block 3406 to modify the verification data. In decision block 3413, if the user selects save button, then the component saves the verification data in block 3414 and continues at block 3401.

[0028] Figure 35 is a flow diagram illustrating the processing of a layout design component in one embodiment. In block 3501, the component inputs the layout design. If the user selects the design button the component displays the PDF form of the layout top and front views in block 3502 and continues at block 3501.

[0029] For the sake of good order, various aspects of the invention are set out in the following clauses:-

1. A method in a computer system for presenting data relating to selection of a compression train, the method comprising:

receiving from a user a configuration data set that specifies operating conditions for a compression train (3101, 3103, 3104, 3105, 3106, 3107);
sending the configuration data set to the calculation engine;
receiving from the calculation engine a proposed configuration for the compression train developed based on the sent configuration data set (3107);
sending to the user a display page indicating the proposed configuration (3111); and
receiving from the user a request for a quotation for the proposed configuration (3014).

2. The method of clause 1 wherein a computer of the user is connected to the computer system via the Internet.

3. The method of clause 1 wherein the display page is a web page.

4. The method of clause 1 including

receiving from the user a layout design for the proposed configuration; and
sending to the user a display page illustrating the received layout design.

5. The method of clause 1 wherein the computer system allows the user to group configuration data sets into projects.

6. The method of clause 1 wherein the configuration data set includes environmental conditions, driver specifications, and compression data.

7. The method of clause 6 wherein the environmental conditions include design pressure and design temperature.

8. The method of clause 6 wherein the driver specification includes driver type, gas turbine data, and compressor speed.

9. The method of clause 6 wherein the driver specification includes fuel gas composition.

10. The method of clause 6 wherein the compression data includes suction pressure, discharge pressure, and suction temperature.

11. The method of clause 6 wherein the compression data includes process gas composition.

12. The method of clause 1 wherein the operating conditions include compressor options.

13. The method of clause 12 wherein the compressor options include casing type.

14. The method of clause 12 wherein the compressor options include stage compression ratios.

15. The method of clause 1 wherein the operating conditions include interstage data.

16. The method of clause 15 wherein the interstage data includes interstage pressure drops and interstage discharge pressures.

17. The method of clause 1 wherein the proposed configuration includes indications of driver target, gear box, or one or more compression casings.

18. The method of clause 1 wherein the proposed configuration includes indications of discharge pressure, discharge temperature, and number of stages.

19. The method of clause 1 wherein the proposed configuration includes indications of actual discharge flow, power margin, and absorbed power at driver shaft.

20. A computer system for presenting data relating to selection of a compression train, comprising:

a list projects component for managing a list of projects, each project having one or more configuration data sets that each specify a configuration data set having operating conditions for a compression train (2905);
a new configuration component for specifying a configuration data set, for receiving a proposed configuration automatically generated based on a specified configuration data set, and for providing the proposed configuration to a user (2906); and
a new request for configuration and quote component for specifying a configuration data set and for sending the specified configuration data set for manual determination of a proposed configuration(2907).

21. The computer system of clause 20 including a layout component for receiving from a user a layout of a proposed configuration and for displaying a representation of the layout to the user.

22. The computer system of clause 20 wherein the computer system is connected to a user computer via the Internet.

23. The computer system of clause 20 wherein the providing of the proposed configuration including sending a web page to a user computer.

24. The computer system of clause 20 wherein the lists project component allows the user to group configuration data sets into projects.

25. The computer system of clause 20 wherein the configuration data set includes environmental conditions, driver specifications, and compression data.

26. The computer system of clause 25 wherein the environmental conditions include design pressure and design temperature.

27. The computer system of clause 25 wherein the driver specification includes driver type, gas turbine data, and compressor speed.

28. The computer system of clause 25 wherein the driver specification includes fuel gas composition.

29. The computer system of clause 25 wherein the compression data includes suction pressure, discharge pressure, and suction temperature.

30. The computer system of clause 25 wherein the compression data includes process gas composition.

31. The computer system of clause 20 wherein the operating conditions include compressor options.

32. The computer system of clause 31 wherein the compressor options include casing type.

33. The computer system of clause 31 wherein the compressor options include stage compression ratios.

34. The computer system of clause 20 wherein the operating conditions include interstage data.

35. The computer system of clause 34 wherein the interstage data includes interstage pressure drops and interstage discharge pressures.

36. The computer system of clause 20 wherein the proposed configuration includes indications of driver target, gear box, or one or more compression casings.

37. The computer system of clause 20 wherein the proposed configuration includes indications of discharge pressure, discharge temperature, and number of stages.

38. The computer system of clause 20 wherein the proposed configuration includes indications of actual discharge flow, power margin, and absorbed power at driver shaft.

Claims

1. A method in a computer system for presenting data relating to selection of a compression train, the method comprising:

   receiving from a user a configuration data set that specifies operating conditions for a compression train (3101, 3103, 3104, 3105, 3106, 3107);
   sending the configuration data set to the calculation engine;
   receiving from the calculation engine a proposed configuration for the compression train developed based on the sent configuration data set (3107);
   sending to the user a display page indicating the proposed configuration (3111); and
   receiving from the user a request for a quotation for the proposed configuration (3014).

2. The method of claim 1 wherein a computer of the user is connected to the computer system via the Internet.

3. The method of claim 1 or 2 wherein the display page is a web page.

4. The method of claim 1, 2 or 3 including

   receiving from the user a layout design for the proposed configuration; and
   sending to the user a display page illustrating the received layout design.

5. The method of any preceding claim wherein the computer system allows the user to group configuration data sets into projects.

6. A computer system for presenting data relating to selection of a compression train, comprising:

   a list projects component for managing a list of projects, each project having one or more configuration data sets that each specify a configuration data set having operating conditions for a compression train (2905);
   a new configuration component for specifying a configuration data set, for receiving a proposed configuration automatically generated based on a specified configuration data set, and for providing the proposed configuration to a user (2906); and

a new request for configuration and quote component for specifying a configuration data set and for sending the specified configuration data set for manual determination of a proposed configuration(2907).

7. The computer system of claim 6 including a layout component for receiving from a user a layout of a proposed configuration and for displaying a representation of the layout to the user.

8. The computer system of claim 6 or 7 wherein the computer system is connected to a user computer via the Internet.

9. The computer system of claim 6, 7 or 8 wherein the providing of the proposed configuration includes sending a web page to a user computer.

10. The computer system of any one of claims 6 to 9 wherein the lists project component allows the user to group configuration data sets into projects.

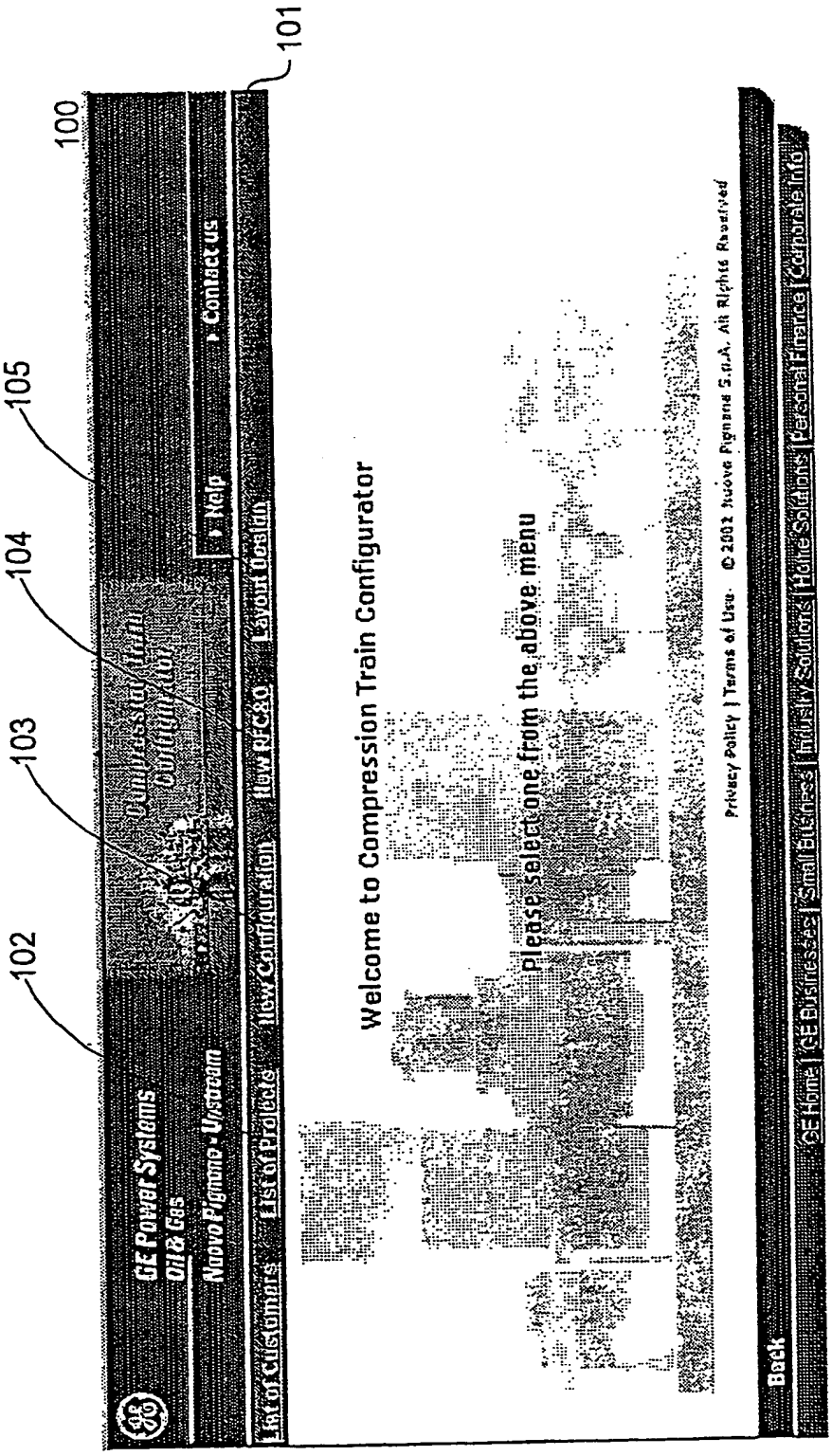
100
101
102
103
104
105
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Compression Train Configuration
Help
Contact us
List of Customers
List of Projects
New Configuration
New Project
Layout Creation
Welcome to Compression Train Configurator
Please select one from the above menu
Privacy Policy | Terms of Use © 2001 Nuovo Pignone S.p.A. All Rights Reserved
Back
GE Home | GE Businesses | Small Biz Ideas | Industry Solutions | Home Solutions | Personal Finance | Corporate Info

Fig. 1

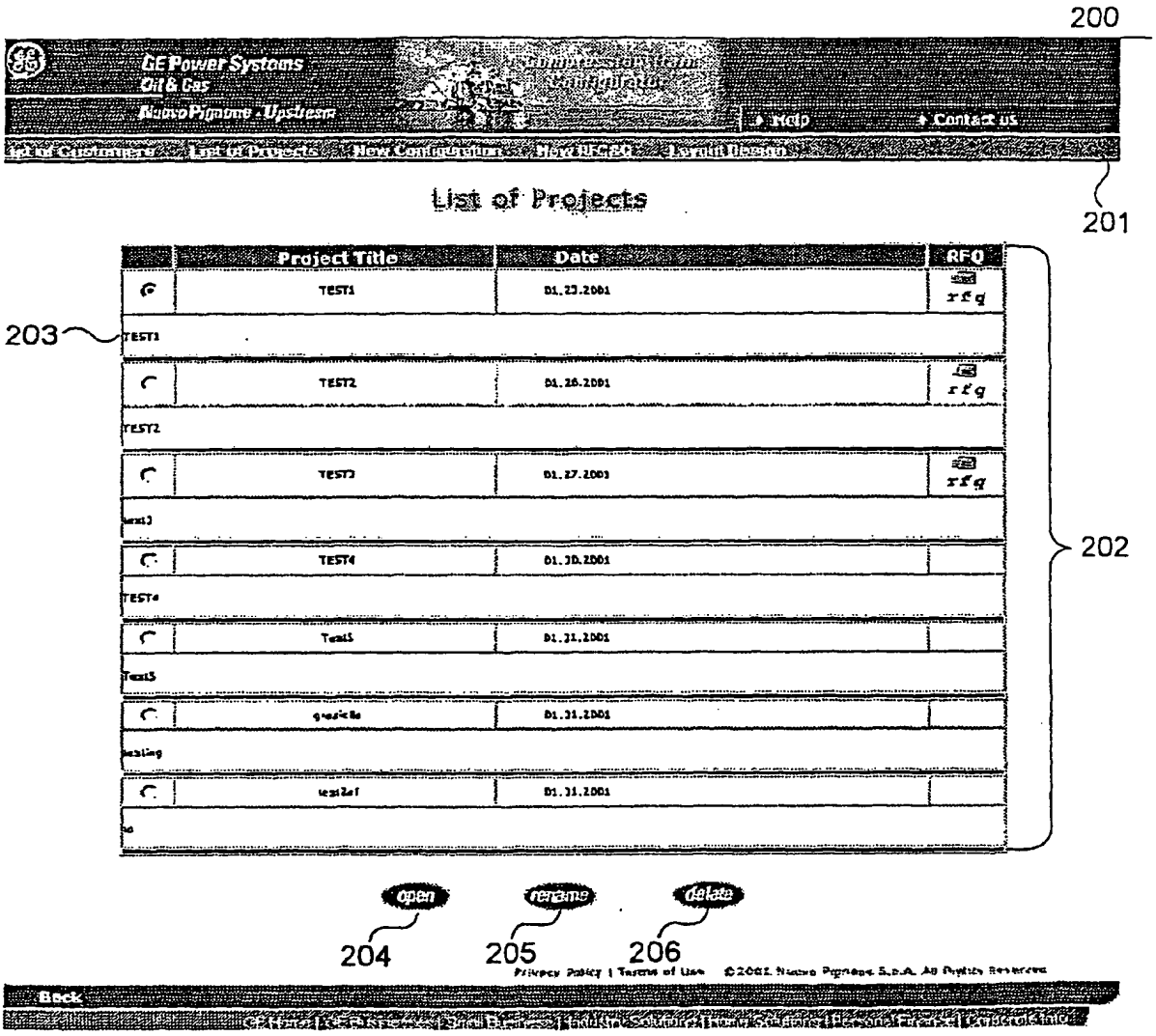
200
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
List of Projects
201
Project Title
Date
RFQ
TEST1
01.23.2001
rfq
TEST2
01.26.2001
rfq
TEST3
01.27.2001
rfq
TEST4
01.30.2001
Test5
01.31.2001
203
202
Open
Rename
Delete
204
205
206
Back

Fig. 2

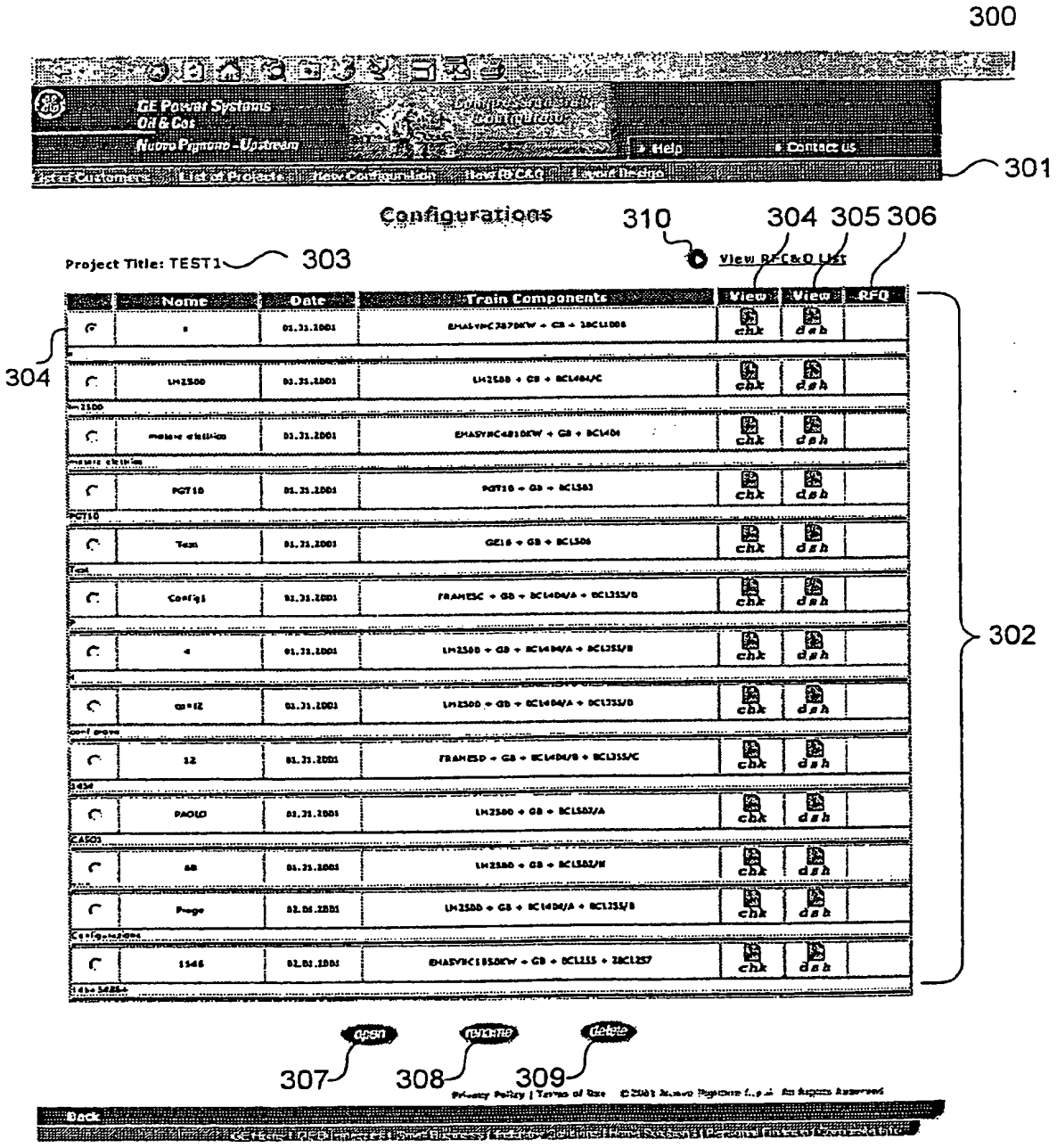
300
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
301
Configurations
310
304
305
306
Project Title: TEST1
303
View RFC&Q List
Name
Date
Train Components
View
View
RFQ
304
302
open
307
308
delete
309
Back

Fig. 3

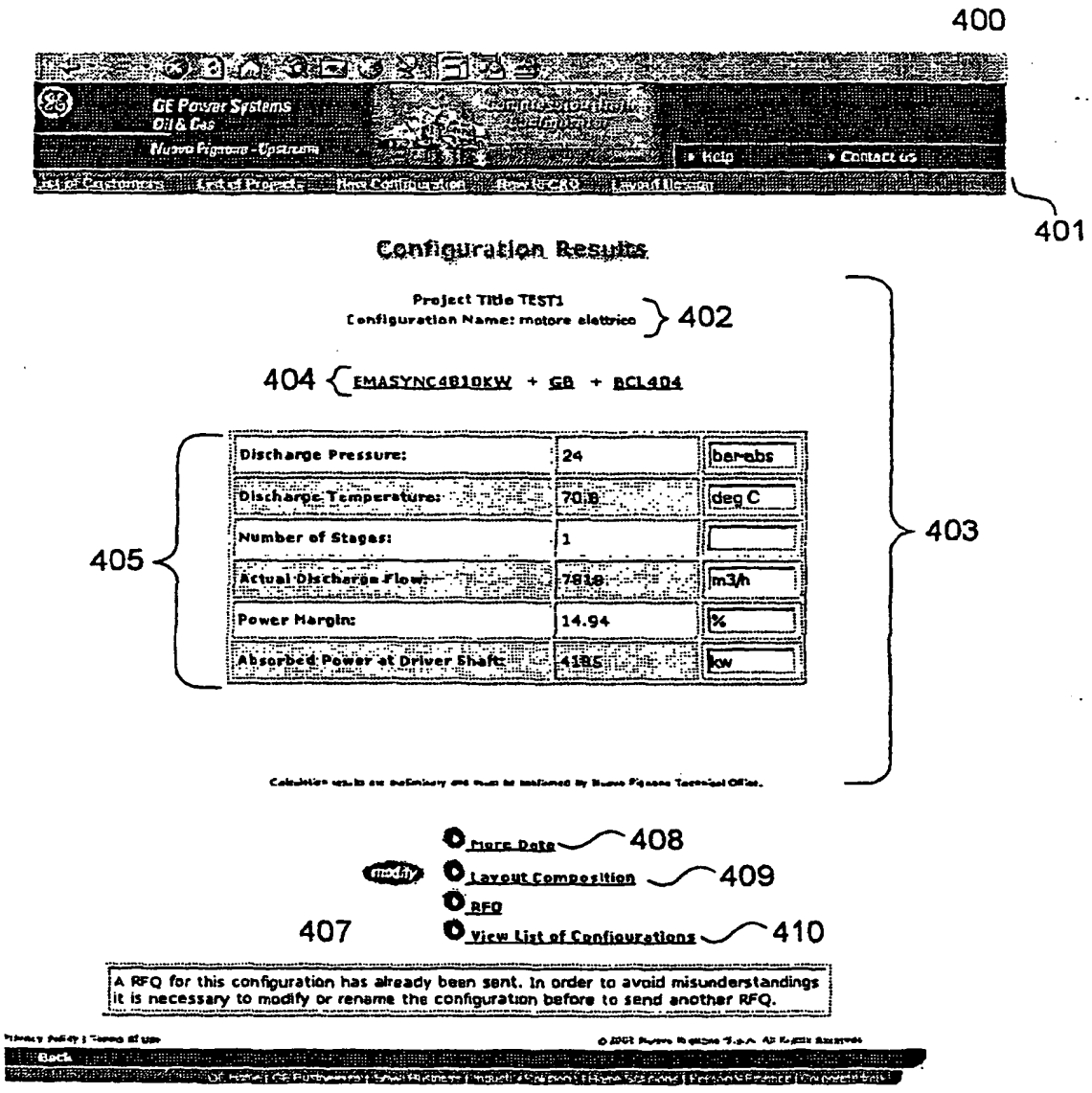
400
GE Power Systems
Oil & Gas
Help
Contact us
401
Configuration Results
Project Title TEST1
Configuration Name: motore elettrico
402
404
EMASYNC4810KW + GB + BCL404
Discharge Pressure: 24 bar-abs
Discharge Temperature: 70.8 deg C
Number of Stages: 1
Actual Discharge Flow: 7818 m3/h
Power Margin: 14.94 %
Absorbed Power at Driver Shaft: 4185 kw
405
403
More Data
408
modify
Layout Composition
409
RFQ
407
View List of Configurations
410
A RFQ for this configuration has already been sent. In order to avoid misunderstandings it is necessary to modify or rename the configuration before to send another RFQ.
Back

Fig. 4

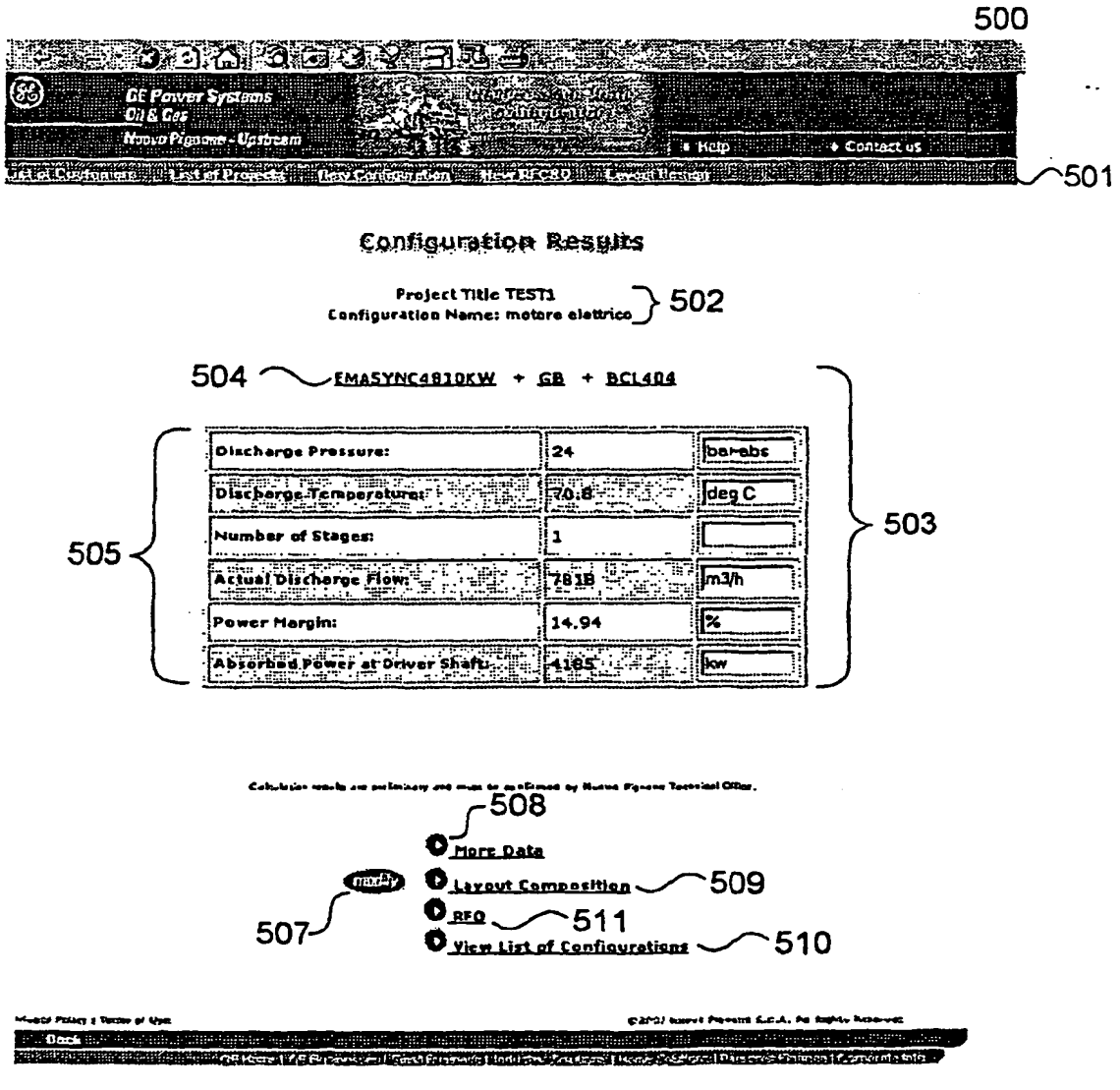
500
GE Power Systems
Oil & Gas
Help
Contact us
501
Configuration Results
Project Title TEST1
Configuration Name: motore elettrico
502
504
FMASYNC4810KW + GB + BCL404
Discharge Pressure: 24 barabs
Discharge Temperature: 70.8 deg C
Number of Stages: 1
Actual Discharge Flow: 7818 m3/h
Power Margin: 14.94 %
Absorbed Power at Driver Shaft: 4185 kw
503
505
508
More Data
Layout Composition
509
RFQ
511
View List of Configurations
510
507

Fig. 5

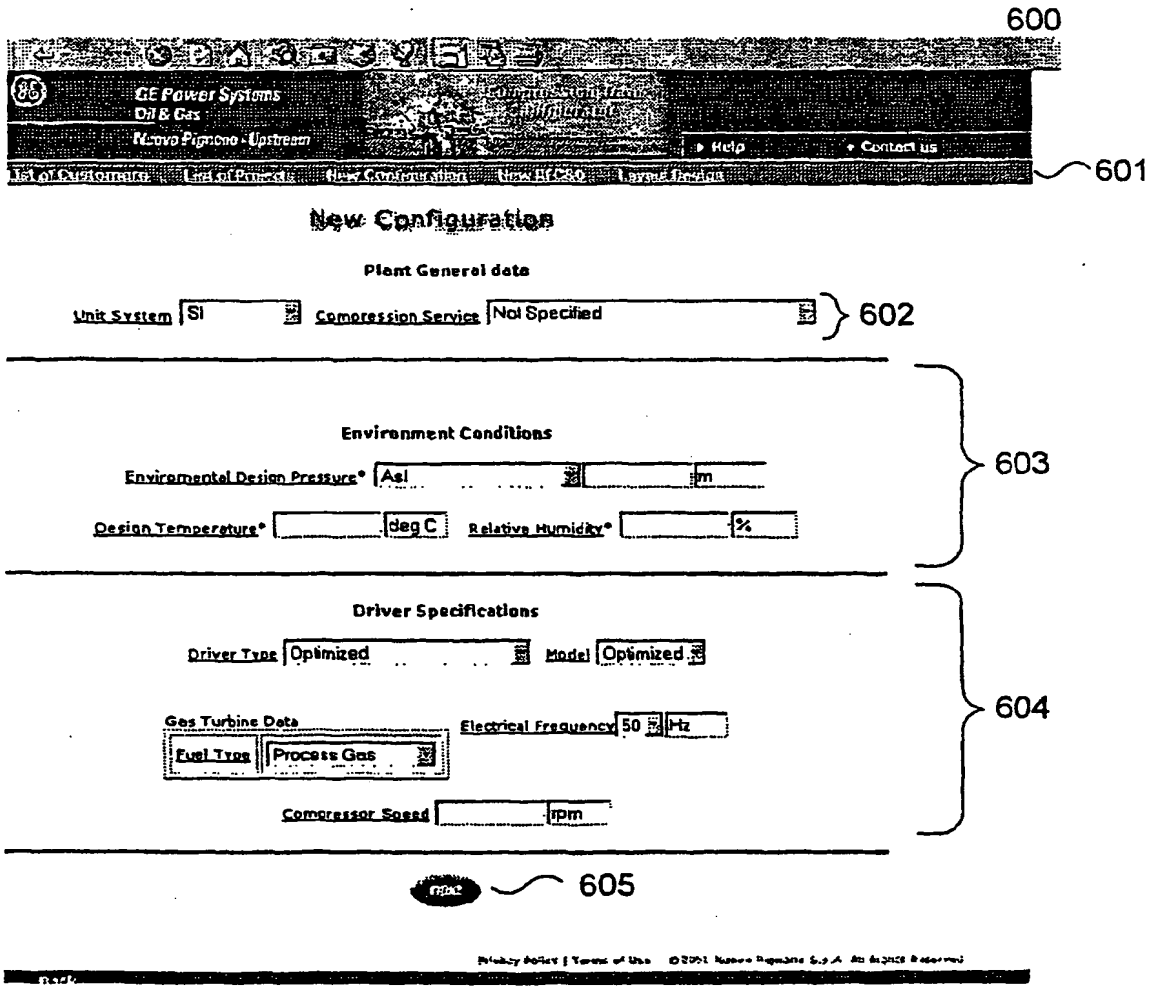
600
GE Power Systems
Oil & Gas
Help
Contact us
601
New Configuration
Plant General data
Unit System
SI
Compression Service
Not Specified
602
Environment Conditions
Environmental Design Pressure*
Asl
m
603
Design Temperature*
deg C
Relative Humidity*
%
Driver Specifications
Driver Type
Optimized
Model
Optimized
Gas Turbine Data
Fuel Type
Process Gas
Electrical Frequency
50
Hz
604
Compressor Speed
rpm
605

Fig. 6

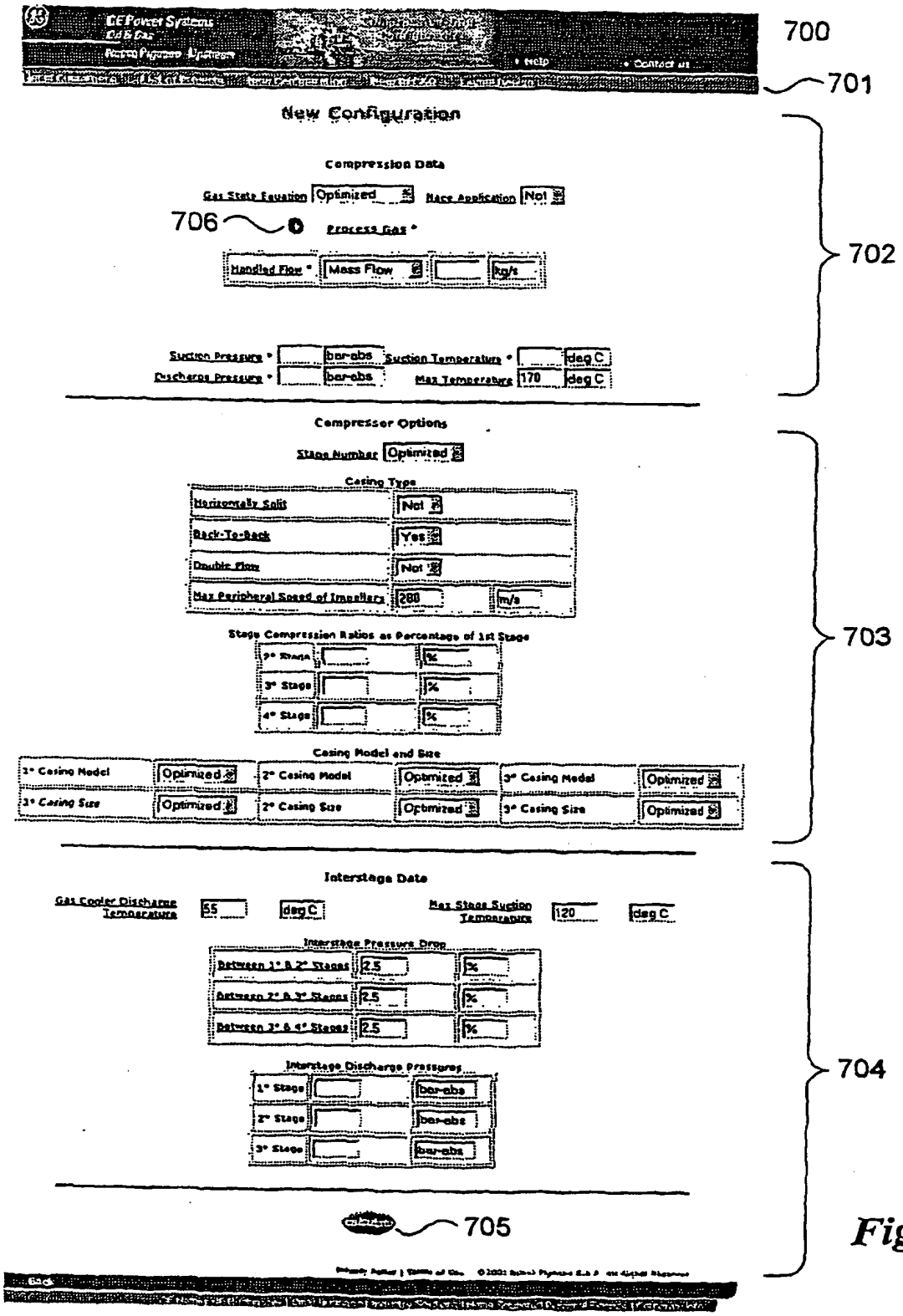
700
701
New Configuration
Compression Data
Gas State Equation
Optimized
Mace Application
Not
706
Process Gas *
Handled Flow *
Mass Flow
kg/s
Suction Pressure *
bar-abs
Suction Temperature *
deg C
Discharge Pressure *
bar-abs
Max Temperature
170
deg C
702
Compresser Options
Stage Number
Optimized
Casing Type
Horizontally Split
Not
Back-To-Back
Yes
Double Flow
Not
Max Peripheral Speed of Impellers
280
m/s
Stage Compression Ratios as Percentage of 1st Stage
2° Stage
3° Stage
4° Stage
%
Casing Model and Size
1° Casing Model
Optimized
2° Casing Model
3° Casing Model
1° Casing Size
2° Casing Size
3° Casing Size
703
Interstage Data
Gas Cooler Discharge Temperature
55
deg C
Max Stage Suction Temperature
120
Interstage Pressure Drop
Between 1° & 2° Stages
2.5
Between 2° & 3° Stages
Between 3° & 4° Stages
Interstage Discharge Pressures
1° Stage
2° Stage
3° Stage
bar-abs
704
705

Fig. 7

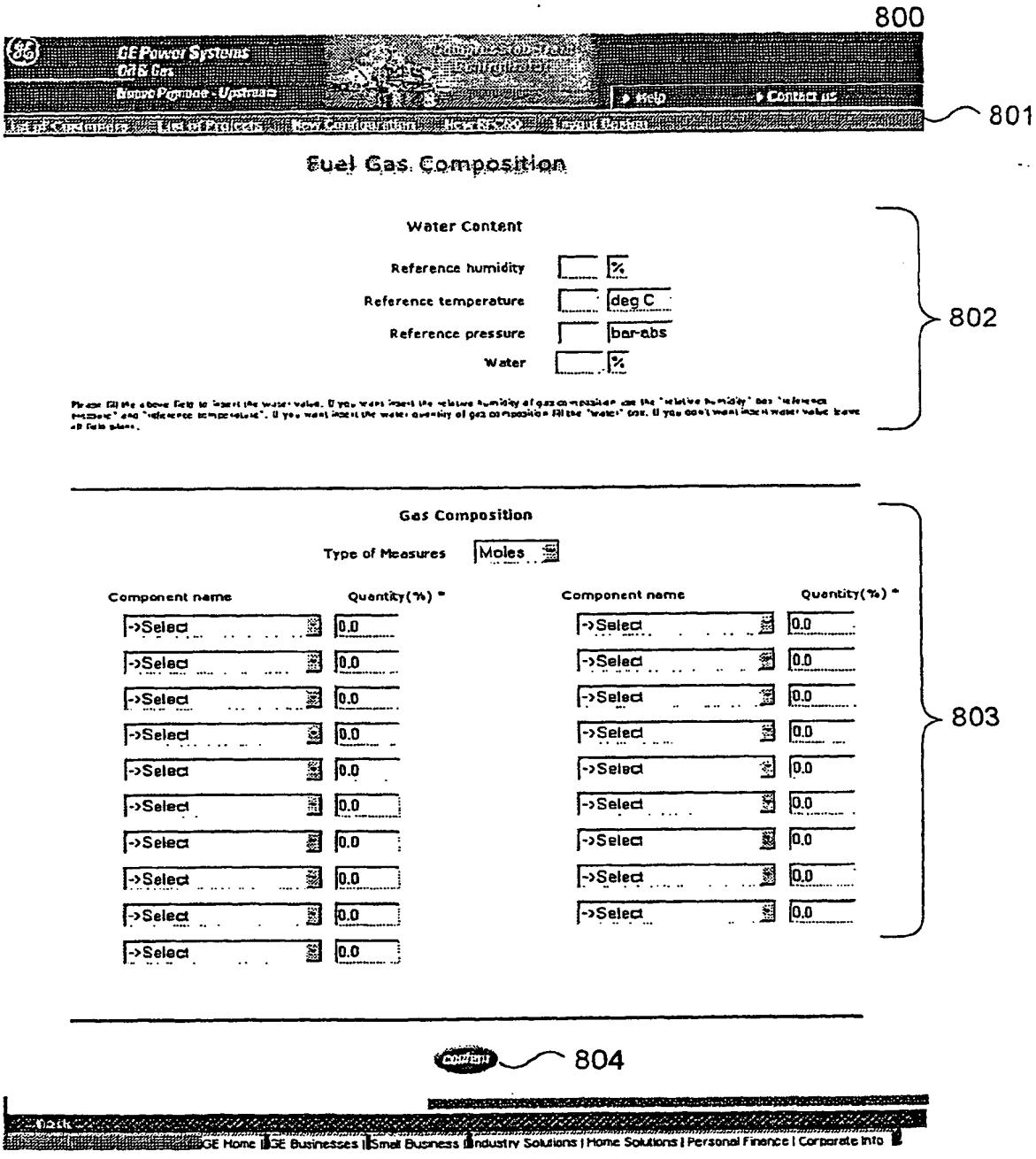
800
GE Power Systems
Oil & Gas
Help
Contact us
801
Fuel Gas Composition
Water Content
Reference humidity
%
Reference temperature
deg C
Reference pressure
bar-abs
Water
%
802
Gas Composition
Type of Measures
Moles
Component name
Quantity(%) *
->Select
0.0
803
804
GE Home
GE Businesses
Small Business
Industry Solutions
Home Solutions
Personal Finance
Corporate Info

Fig. 8

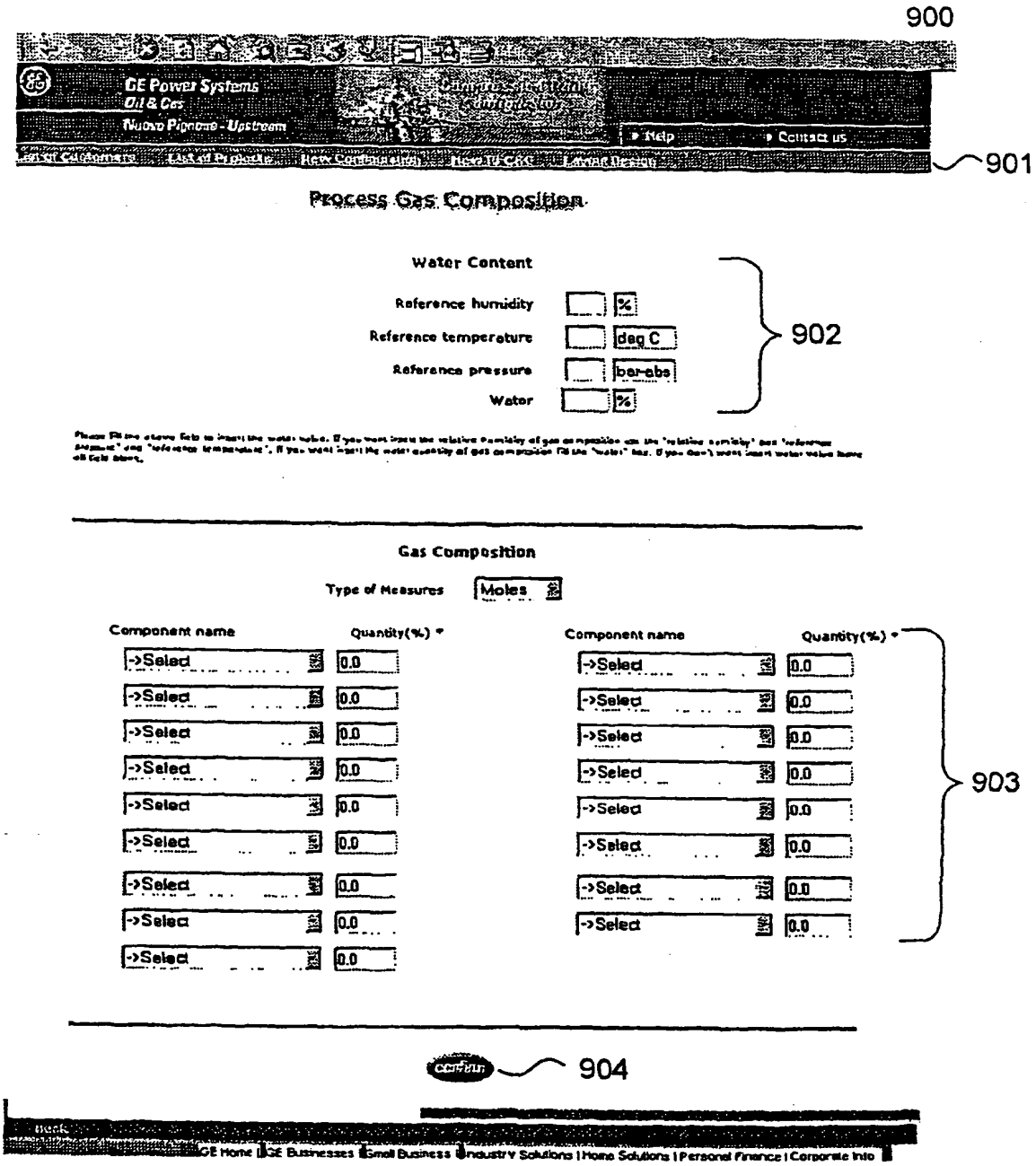
900
GE Power Systems
Oil & Gas
Nuovo Pipelone - Upstream
Help
Contact us
901
Process Gas Composition
Water Content
Reference humidity
%
Reference temperature
deg C
Reference pressure
bar-abs
Water
%
902
Gas Composition
Type of Measures
Moles
Component name
Quantity(%) *
->Select
0.0
903
904
GE Home | GE Businesses | Small Business | Industry Solutions | Home Solutions | Personal Finance | Corporate Info

Fig. 9

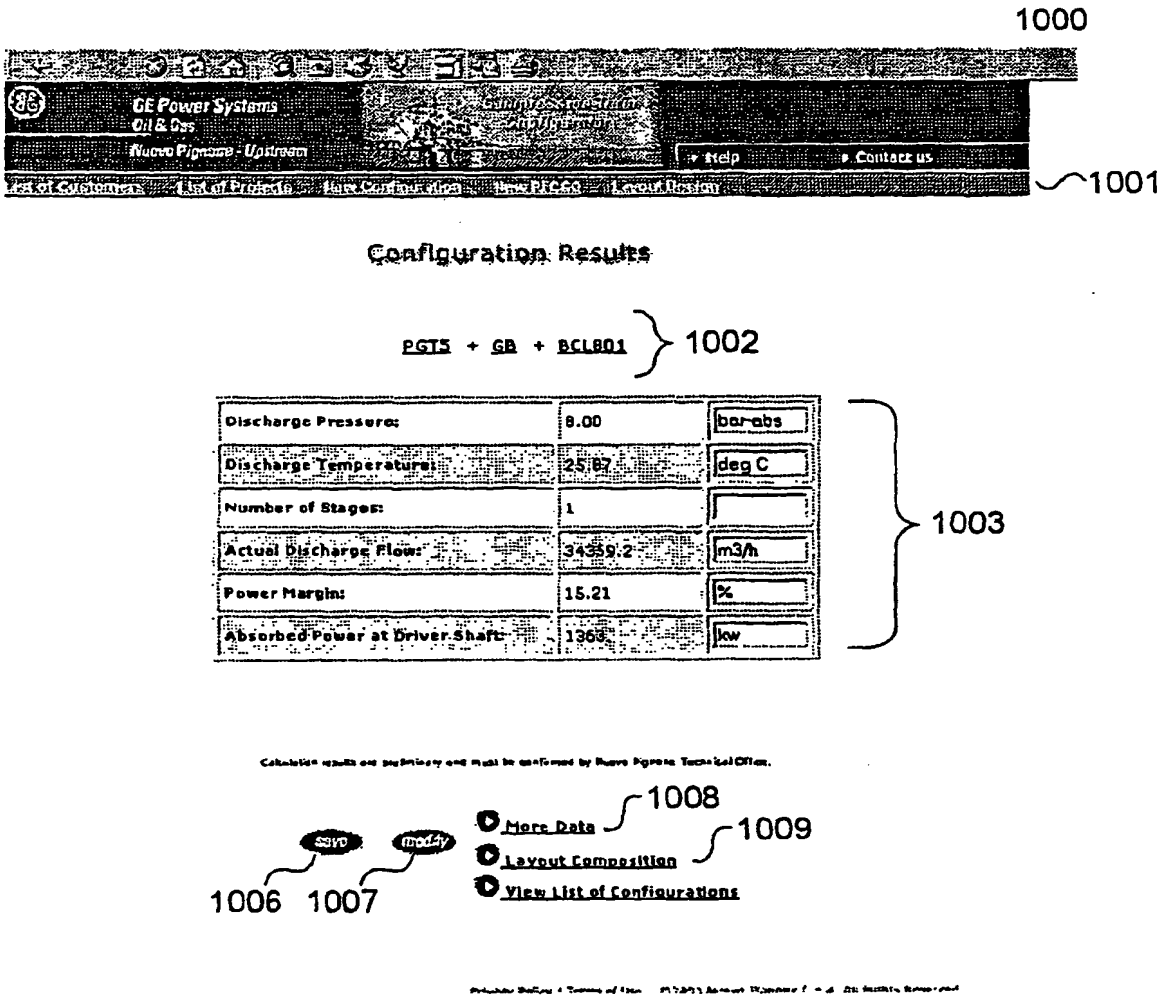
1000
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
1001
Configuration Results
PGTS + GB + BCL801
1002
Discharge Pressure: 8.00 barabs
Discharge Temperature: 25.87 deg C
Number of Stages: 1
Actual Discharge Flow: 34359.2 m3/h
Power Margin: 15.21 %
Absorbed Power at Driver Shaft: 1363 kw
1003
save
modify
1006
1007
More Data
Layout Composition
View List of Configurations
1008
1009

Fig. 10

1100

1101

More Data

Driver Data

Description	Overall	
Discharge Pressure:	8.00	bar-abs
Driver Model:	PGT5	
Actual Discharge Flow:	34359.2	m3/h
Absorbed Power at Driver Shaft:	1363.	kw
Power Margin:	15.21	%
Electrical Frequency:	50	hz

1103

Compression Data

Description	Stage 1	Stage 2	Stage 3	Stage 4	
Molecular Weight:	16.043				1/mole
Handled Flow Mass Flow	50				kg/s
Suction Pressure:	7.00				bar-abs
Suction Temperature:	15.00				deg C
Suction Actual Flow:	37843.5				m3/h
Discharge Pressure:	8.00				bar_abs
Discharge Temperature:	25.87				deg C
Discharge Actual Flow:	34359.2				m3/h
Impeller Number:	1				
Speed:	4024.				rpm
Politropic Efficiency:	84.46				%

1104

	Model	Type	Size	Impeller Number	Rating
Compressor Casing 1	BCL801	BCL	800	1	800
Compressor Casing 2					
Compressor Casing 3					

1105

back

1106

Fig. 11

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Back

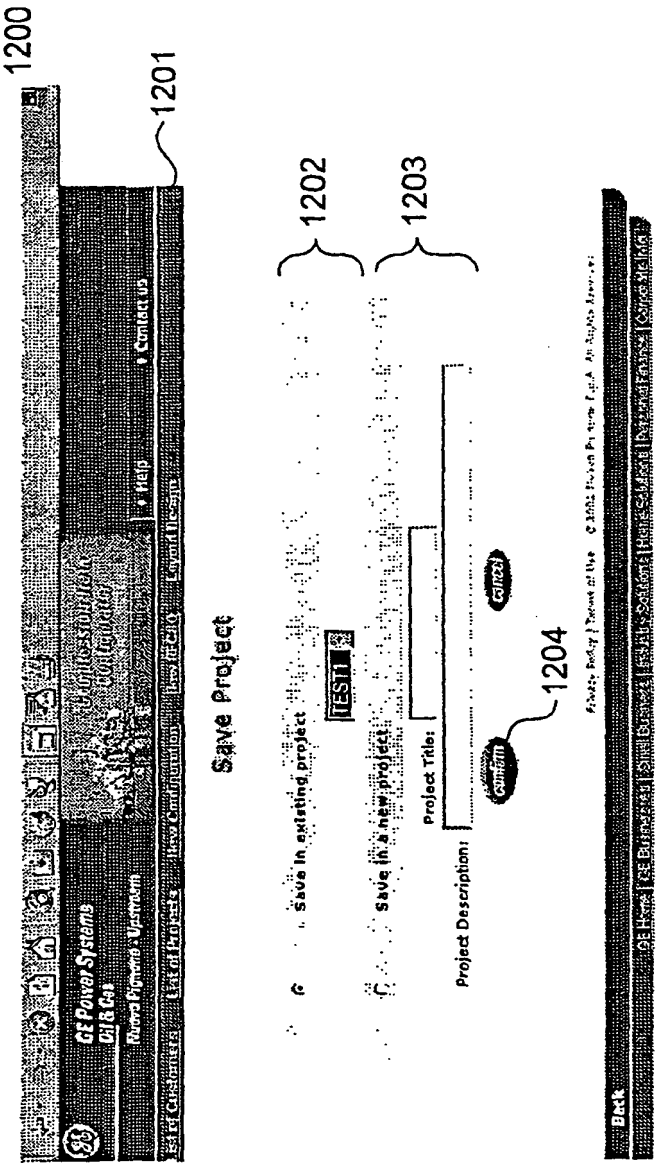
1200
1201
1202
1203
1204
Save Project
Save in existing project
TEST1
Save in a new project
Project Title:
Project Description:
Cancel
Cancel
Back

Fig. 12

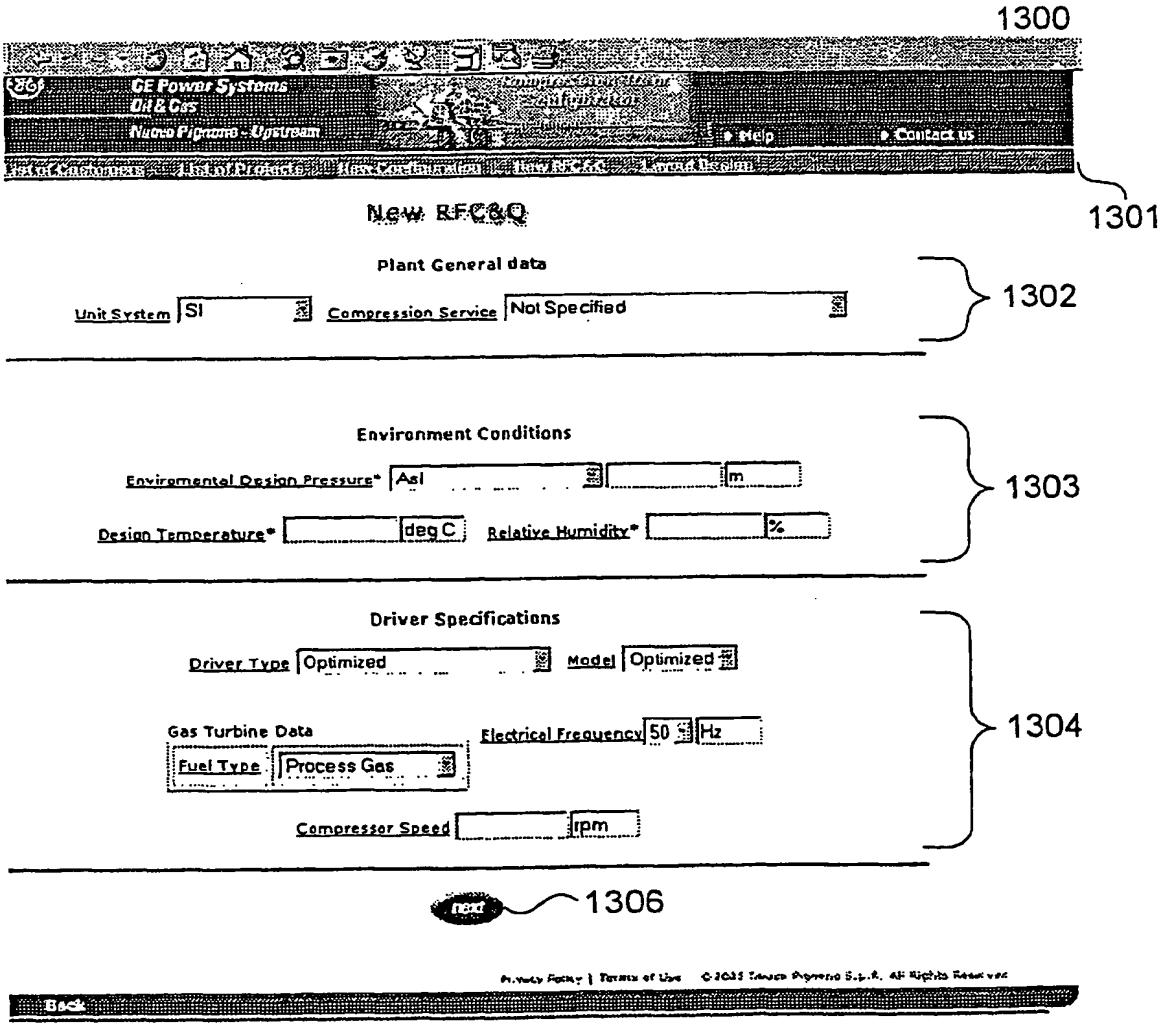
1300
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
1301
New RFC&Q
Plant General data
Unit System
SI
Compression Service
Not Specified
1302
Environment Conditions
Enviromental Design Pressure*
Asl
m
Design Temperature*
deg C
Relative Humidity*
%
1303
Driver Specifications
Driver Type
Optimized
Model
Optimized
Gas Turbine Data
Fuel Type
Process Gas
Electrical Frequency
50
Hz
Compresser Speed
rpm
1304
next
1306
Back

Fig. 13

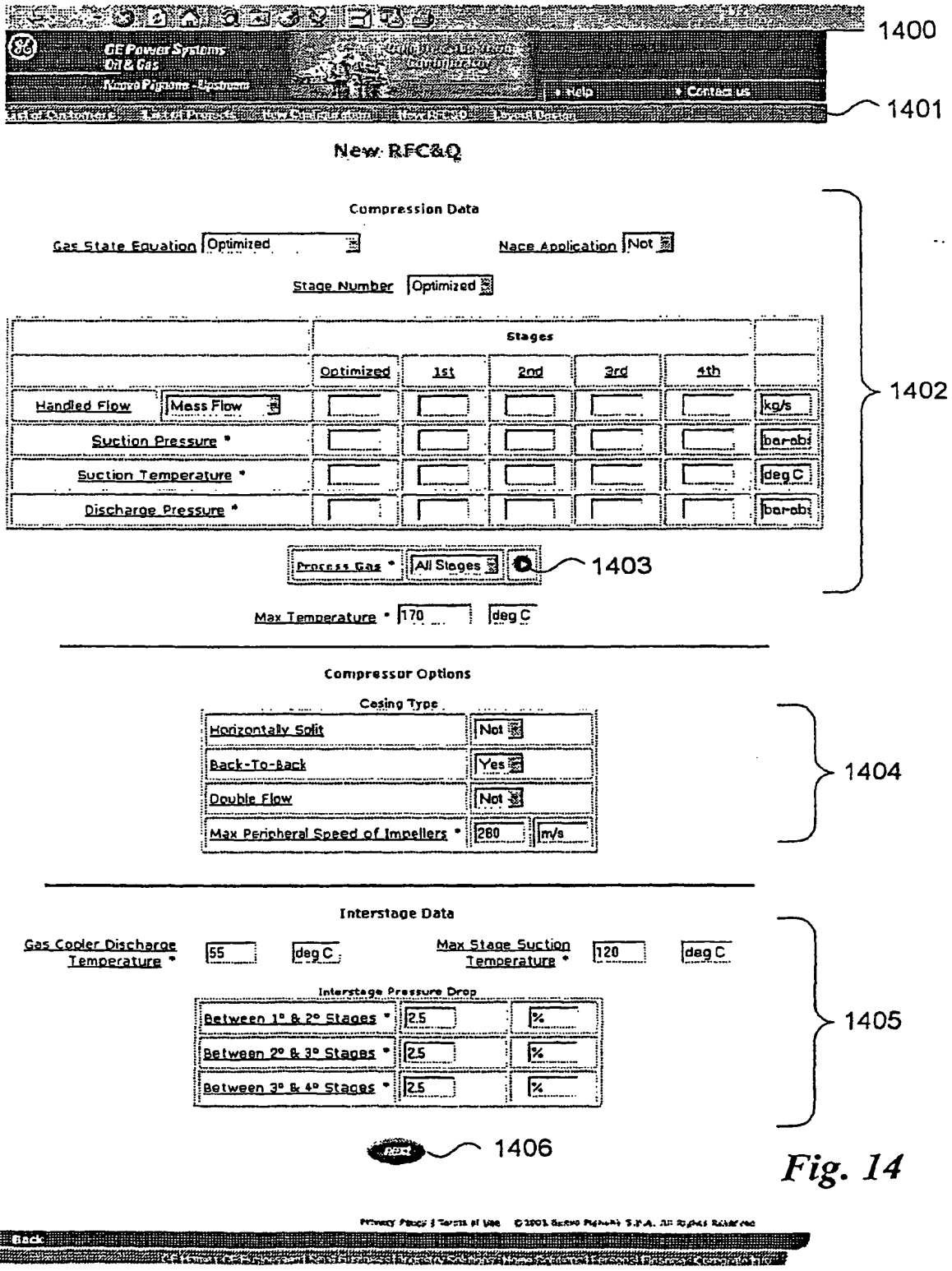
GE Power Systems
Oil & Gas
Help
Contact us
1400
1401
New RFC&Q
Compression Data
Gas State Equation
Optimized
Nace Application
Not
Stage Number
Optimized
Stages
Optimized
1st
2nd
3rd
4th
Handled Flow
Mass Flow
kg/s
Suction Pressure *
barabs
Suction Temperature *
deg C
Discharge Pressure *
barabs
1402
Process Gas *
All Stages
1403
Max Temperature *
170
deg C
Compressor Options
Casing Type
Horizontally Split
Not
Back-To-Back
Yes
Double Flow
Not
Max Peripheral Speed of Impellers *
280
m/s
1404
Interstage Data
Gas Cooler Discharge Temperature *
55
deg C
Max Stage Suction Temperature *
120
deg C
Interstage Pressure Drop
Between 1° & 2° Stages *
2.5
%
Between 2° & 3° Stages *
2.5
%
Between 3° & 4° Stages *
2.5
%
1405
1406
Back

Fig. 14

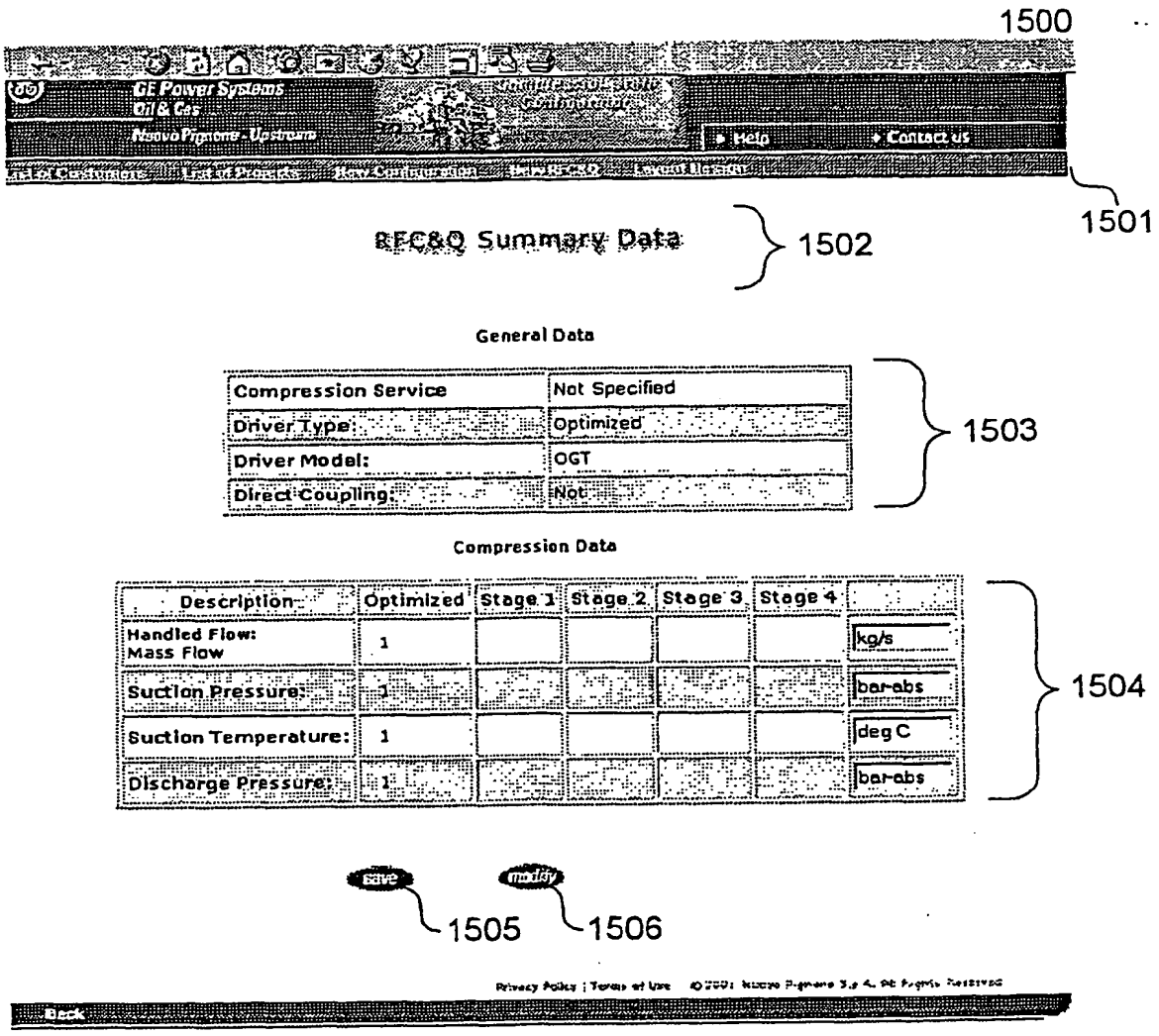
1500
GE Power Systems
Oil & Gas
Help
Contact us
1501
RFC&Q Summary Data
1502
General Data
Compression Service
Not Specified
Driver Type:
Optimized
Driver Model:
OGT
Direct Coupling:
Not
1503
Compression Data
Description
Optimized
Stage 1
Stage 2
Stage 3
Stage 4
Handled Flow: Mass Flow
kg/s
Suction Pressure:
bar-abs
Suction Temperature:
deg C
Discharge Pressure:
bar-abs
1504
save
modify
1505
1506
Back

Fig. 15

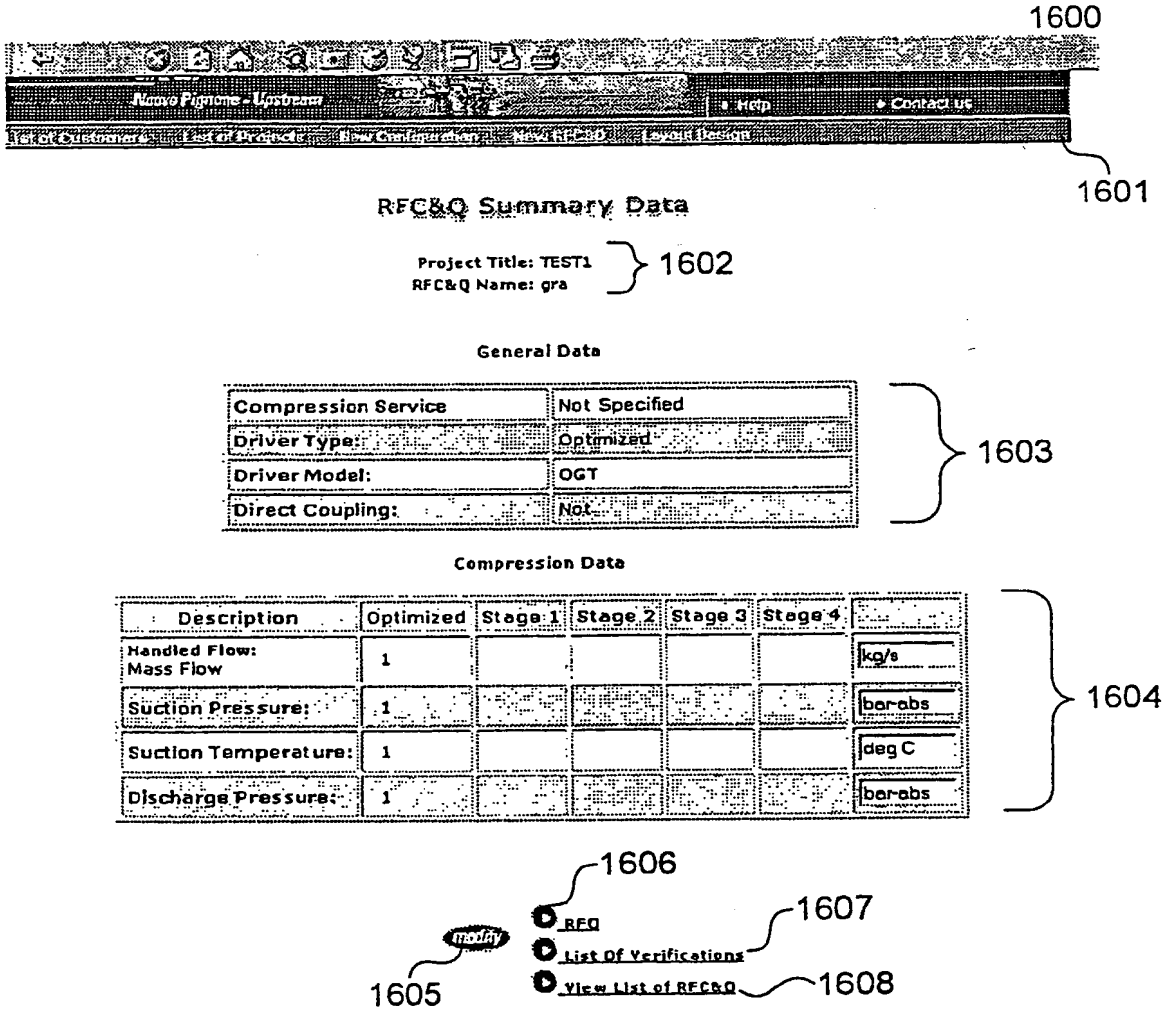
1600
Help
Contact us
1601
RFC&Q Summary Data
Project Title: TEST1
RFC&Q Name: gra
1602
General Data
Compression Service
Not Specified
Driver Type:
Optimized
Driver Model:
OGT
Direct Coupling:
Not
1603
Compression Data
Description
Optimized
Stage 1
Stage 2
Stage 3
Stage 4
Handled Flow: Mass Flow
1
kg/s
Suction Pressure:
1
bar-abs
Suction Temperature:
1
deg C
Discharge Pressure:
1
bar-abs
1604
1606
RFQ
1607
List Of Verifications
View List of RFC&Q
1608
modify
1605

Fig. 16

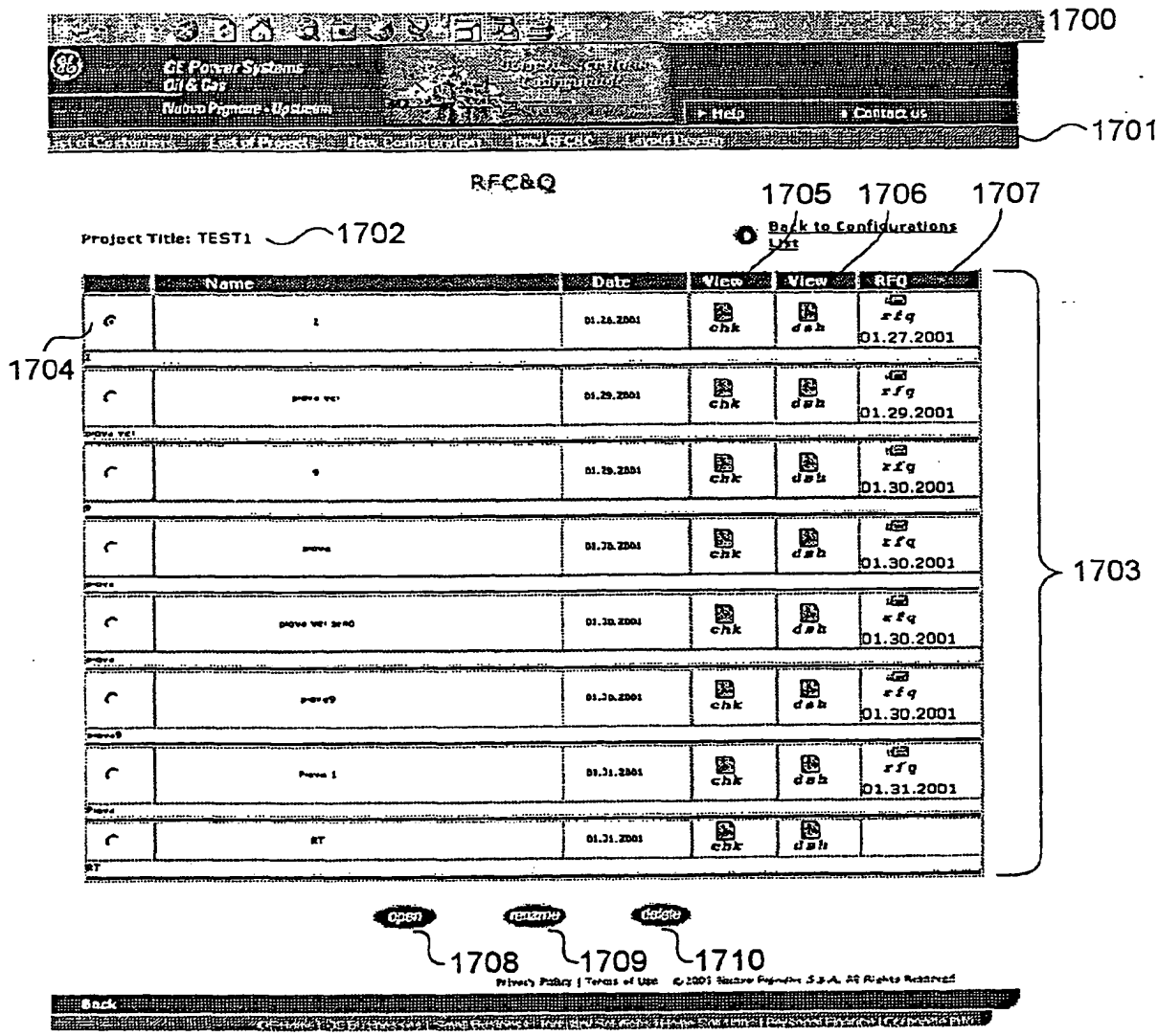
1700
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact Us
1701
RFC&Q
1705
1706
1707
Project Title: TEST1
1702
Back to Configurations List
Name
Date
View
View
RFQ
1704
chk
dsh
rfq
01.27.2001
01.29.2001
01.30.2001
01.30.2001
01.30.2001
01.30.2001
01.31.2001
1703
open
rename
delete
1708
1709
1710
Back

Fig. 17

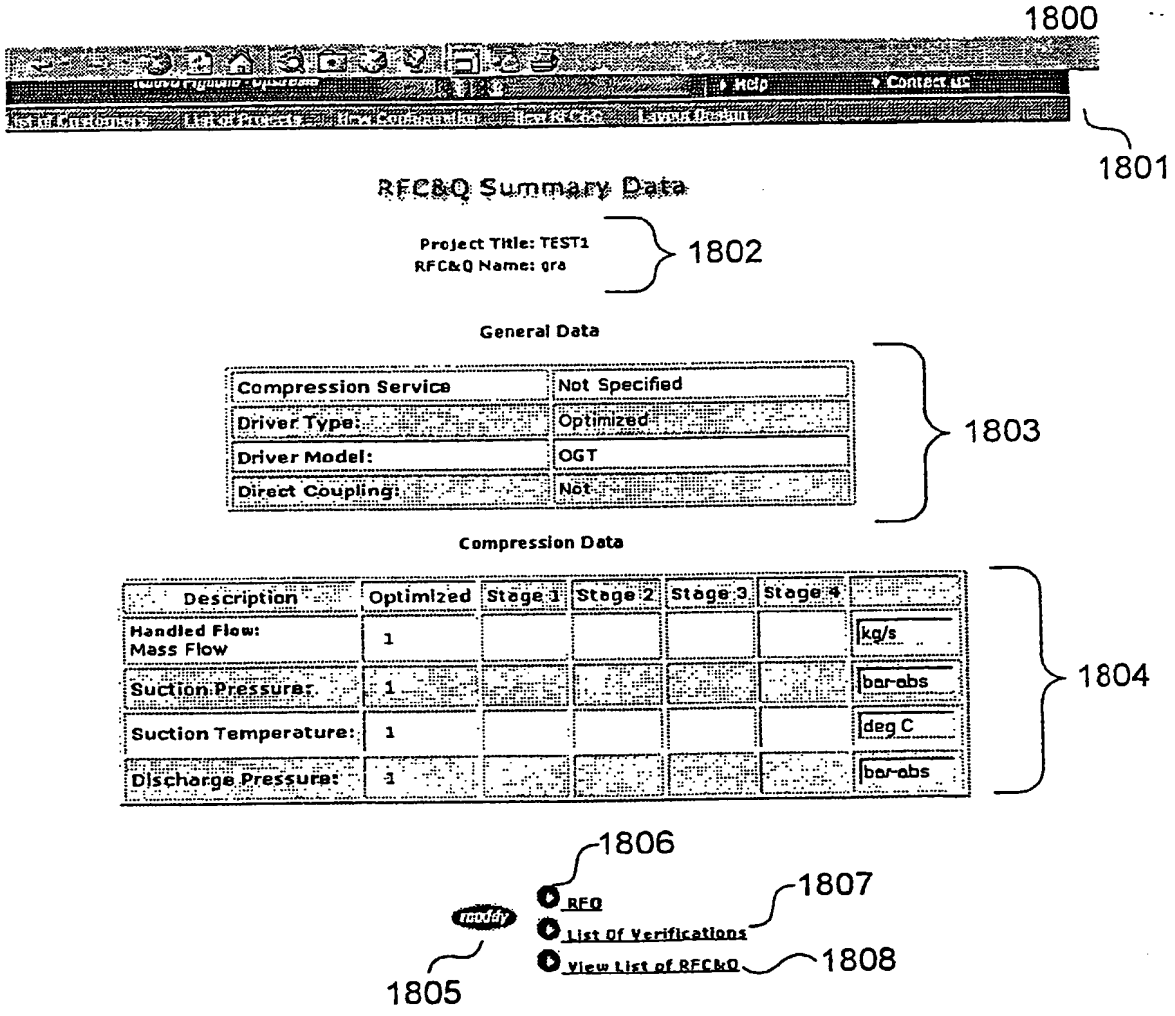
1800
Help
Contact us
1801
RFC&Q Summary Data
Project Title: TEST1
RFC&Q Name: qra
1802
General Data
Compression Service
Not Specified
Driver Type:
Optimized
Driver Model:
OGT
Direct Coupling:
Not
1803
Compression Data
Description
Optimized
Stage 1
Stage 2
Stage 3
Stage 4
Handled Flow: Mass Flow
1
kg/s
Suction Pressure:
1
bar-abs
Suction Temperature:
1
deg C
Discharge Pressure:
1
bar-abs
1804
1806
RFQ
1807
List Of Verifications
View List of RFC&Q
1808
1805

Fig. 18

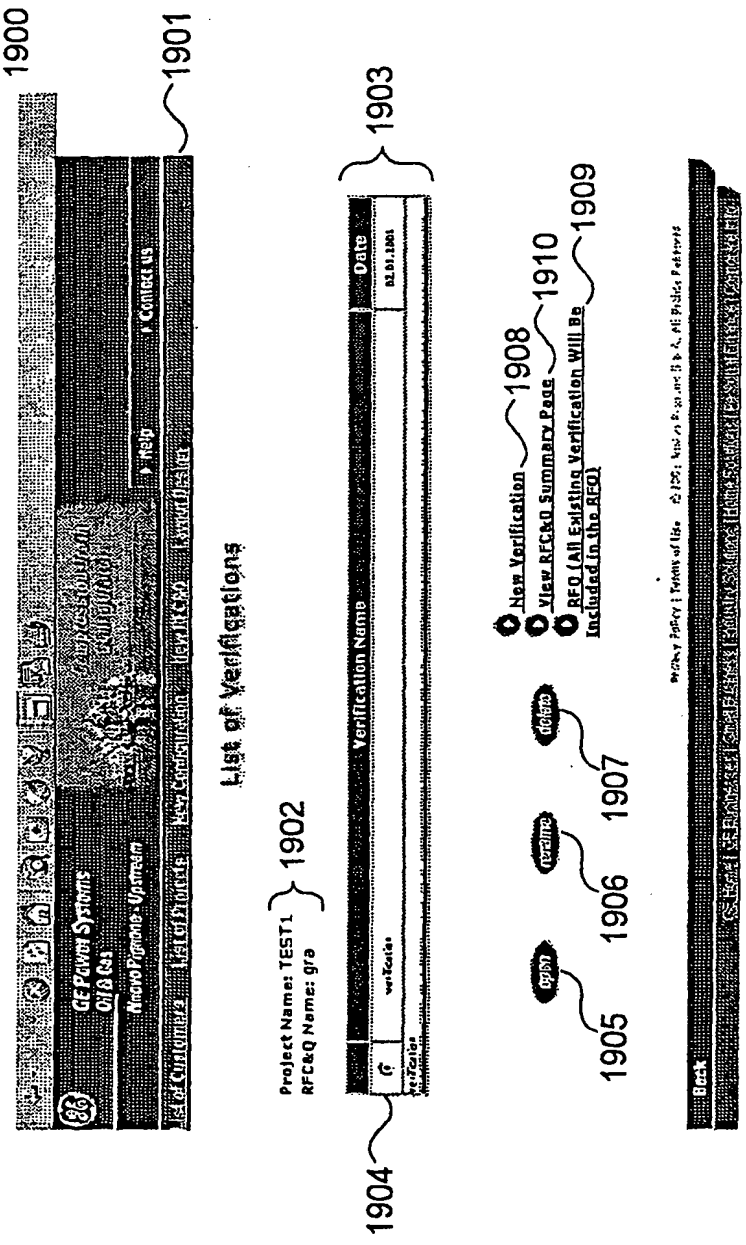
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
List of Verifications
Project Name: TEST1
RFC&Q Name: gra
Verification Name
Date
New Verification
View RFC&Q Summary Page
RFQ (All Existing Verification Will Be Included in the RFQ)
Back

Fig. 19

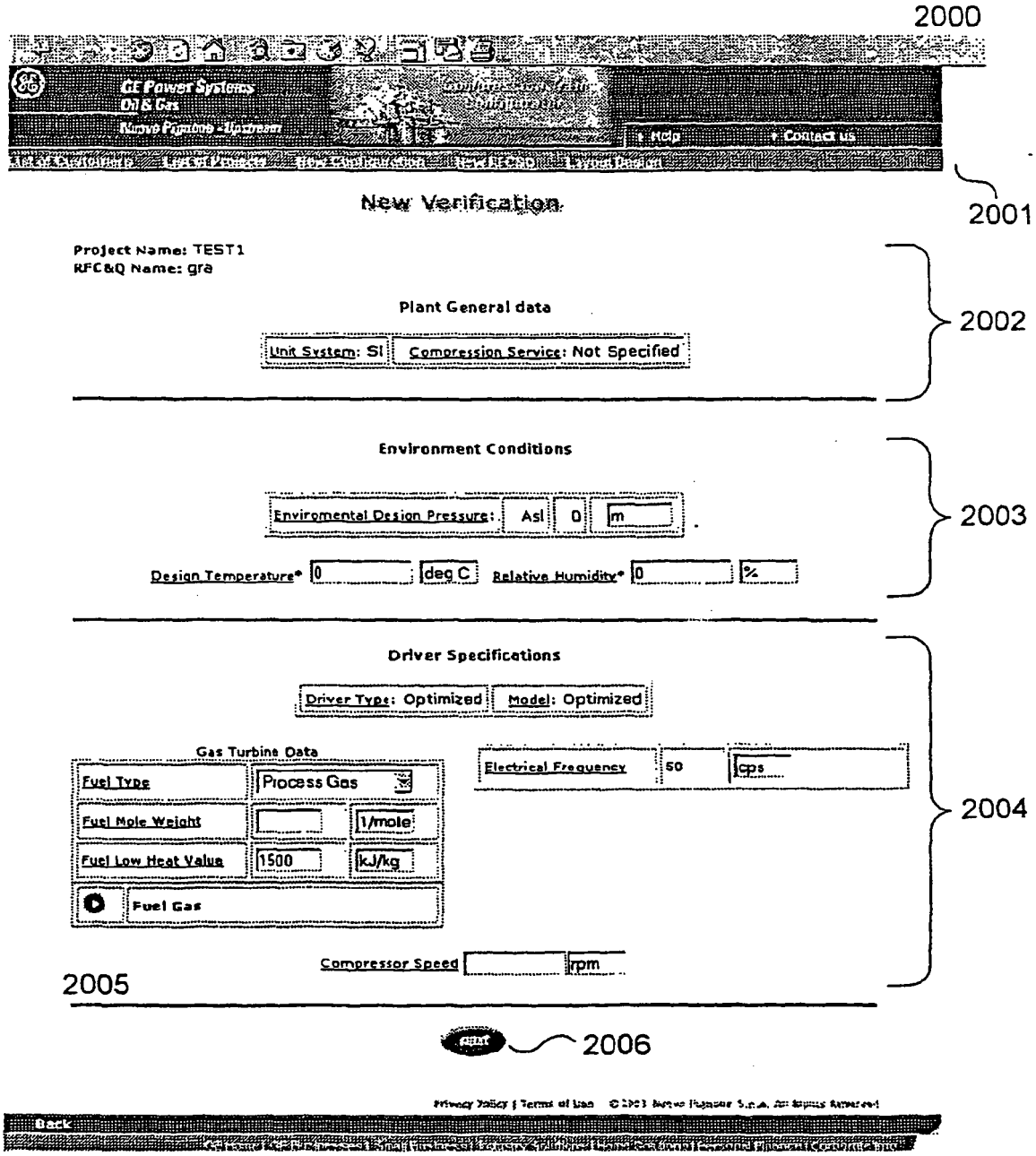
2000
GE Power Systems
Oil & Gas
Help
Contact us
New Verification
2001
Project Name: TEST1
RFC&Q Name: gra
Plant General data
Unit System: SI
Compression Service: Not Specified
2002
Environment Conditions
Enviromental Design Pressure:
Asl
0
m
Design Temperature*
0
deg C
Relative Humidity*
0
%
2003
Driver Specifications
Driver Type: Optimized
Model: Optimized
Gas Turbine Data
Fuel Type
Process Gas
Fuel Mole Weight
1/mole
Fuel Low Heat Value
1500
kJ/kg
Fuel Gas
Electrical Frequency
50
cps
2004
Compressor Speed
rpm
2005
2006
Back

Fig. 20

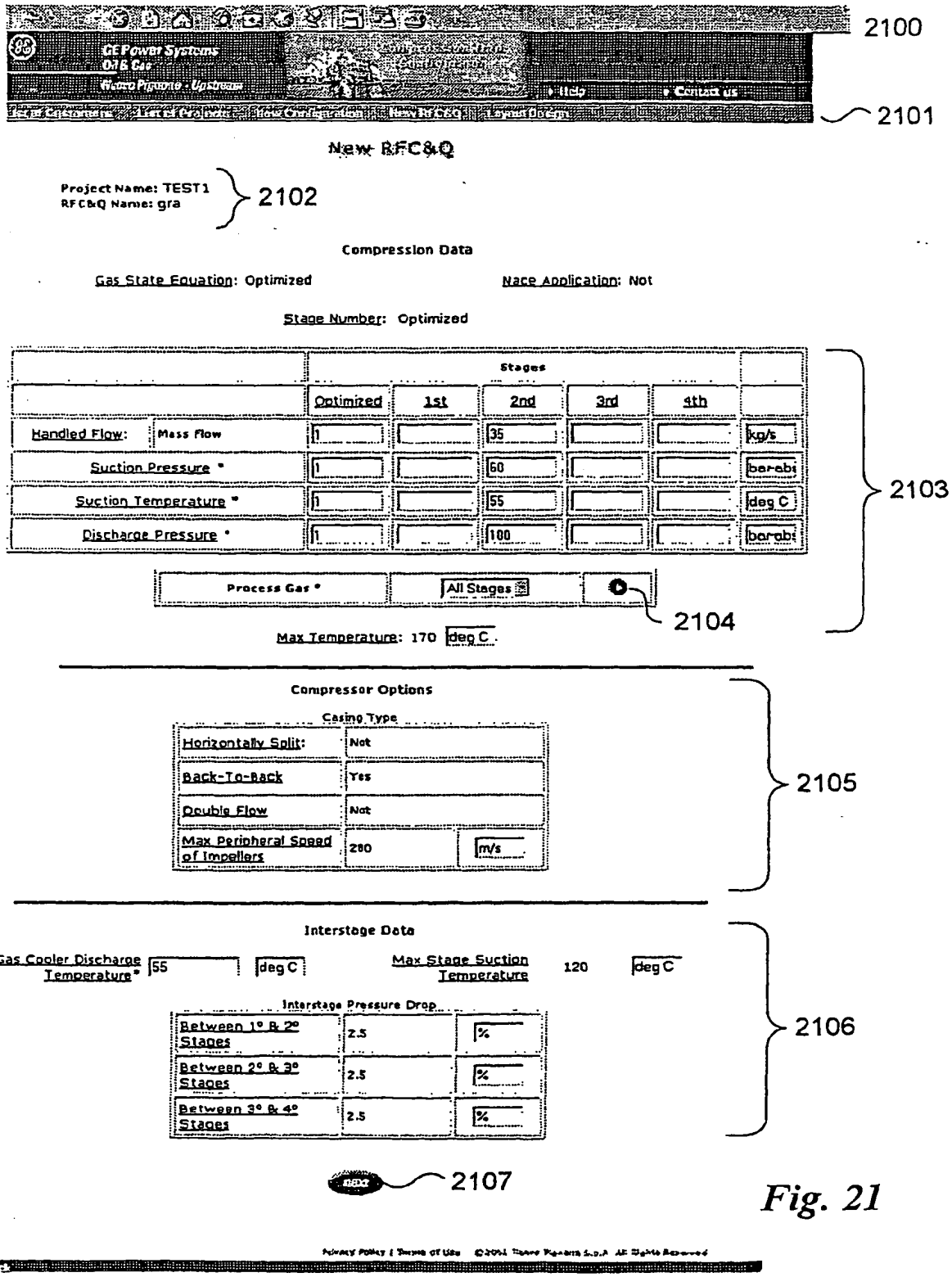
2100
GE Power Systems
Oil & Gas
Help
Contact us
2101
New RFC&Q
Project Name: TEST1
RFC&Q Name: gra
2102
Compression Data
Gas State Equation: Optimized
Nace Application: Not
Stage Number: Optimized
Stages
Optimized
1st
2nd
3rd
4th
Handled Flow:
Mass Flow
kg/s
Suction Pressure *
barabs
Suction Temperature *
deg C
Discharge Pressure *
barabs
2103
Process Gas *
All Stages
2104
Max Temperature: 170 deg C
Compressor Options
Casing Type
Horizontally Split:
Not
Back-To-Back
Yes
Double Flow
Not
Max Peripheral Speed of Impellers
280
m/s
2105
Interstage Data
Gas Cooler Discharge Temperature*
55
deg C
Max Stage Suction Temperature
120
deg C
Interstage Pressure Drop
Between 1° & 2° Stages
2.5
%
Between 2° & 3° Stages
2.5
%
Between 3° & 4° Stages
2.5
%
2106
2107

Fig. 21

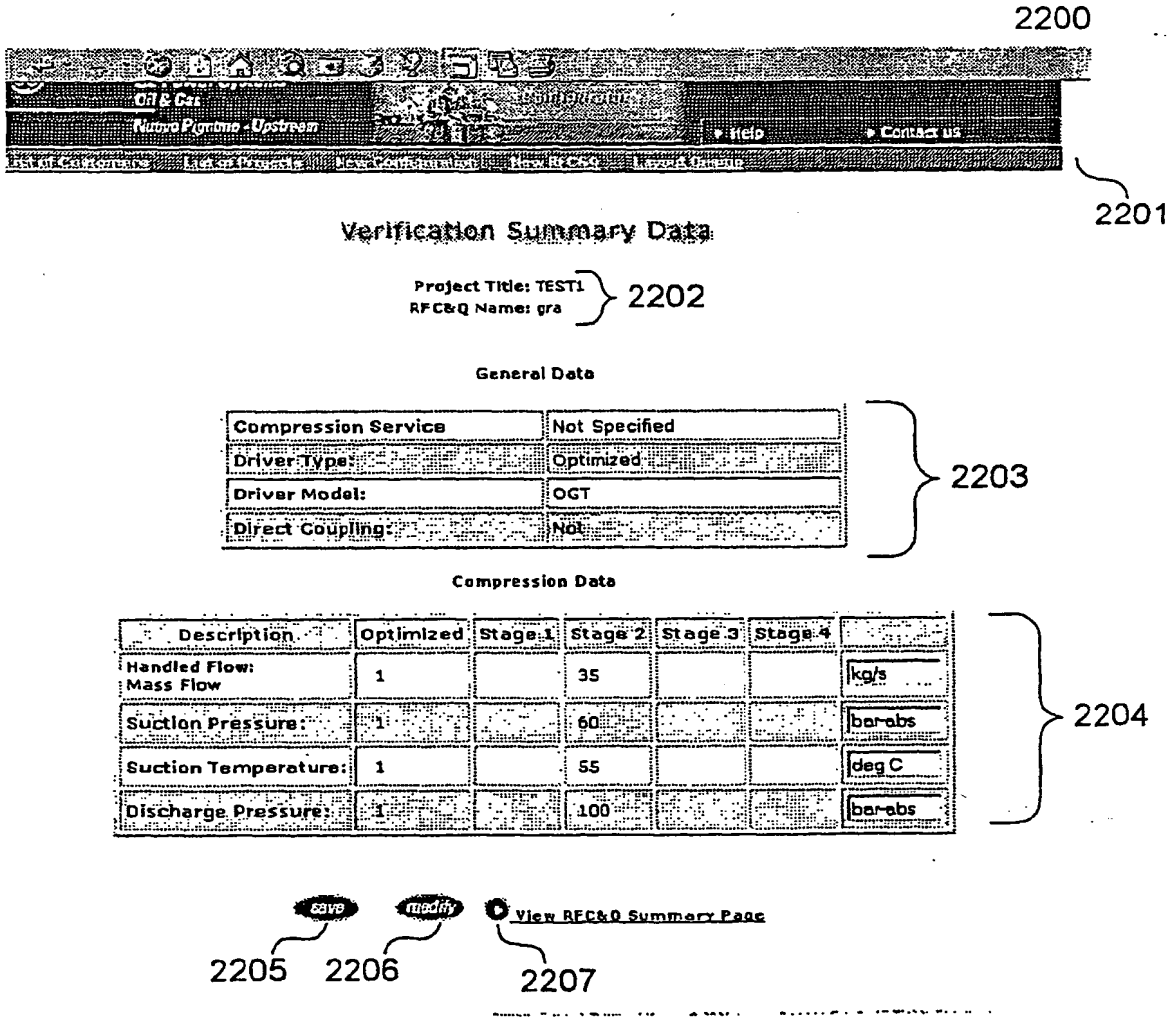
2200
Natural Pipeline - Upstream
help
Contact us
2201
Verification Summary Data
Project Title: TEST1
RFC&Q Name: gra
2202
General Data
Compression Service
Not Specified
Driver Type:
Optimized
Driver Model:
OGT
Direct Coupling:
Not
2203
Compression Data
Description
Optimized
Stage 1
Stage 2
Stage 3
Stage 4
Handled Flow: Mass Flow
1
35
kg/s
Suction Pressure:
1
60
bar-abs
Suction Temperature:
1
55
deg C
Discharge Pressure:
1
100
bar-abs
2204
save
modify
View RFC&Q Summary Page
2205
2206
2207

Fig. 22

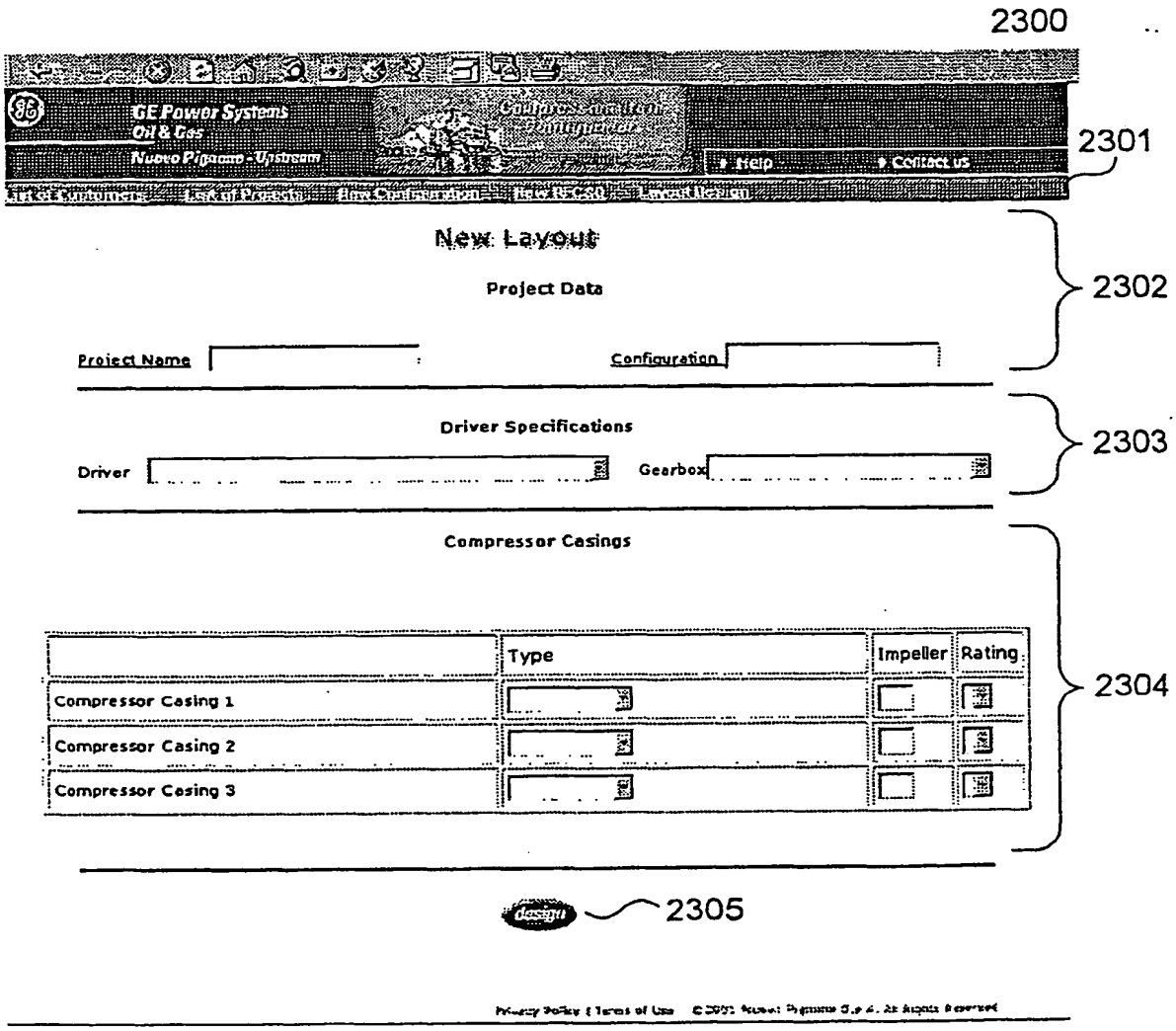
2300
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
2301
New Layout
Project Data
Project Name
Configuration
2302
Driver Specifications
Driver
Gearbox
2303
Compressor Casings
Type
Impeller
Rating
Compressor Casing 1
Compressor Casing 2
Compressor Casing 3
2304
2305

Fig. 23

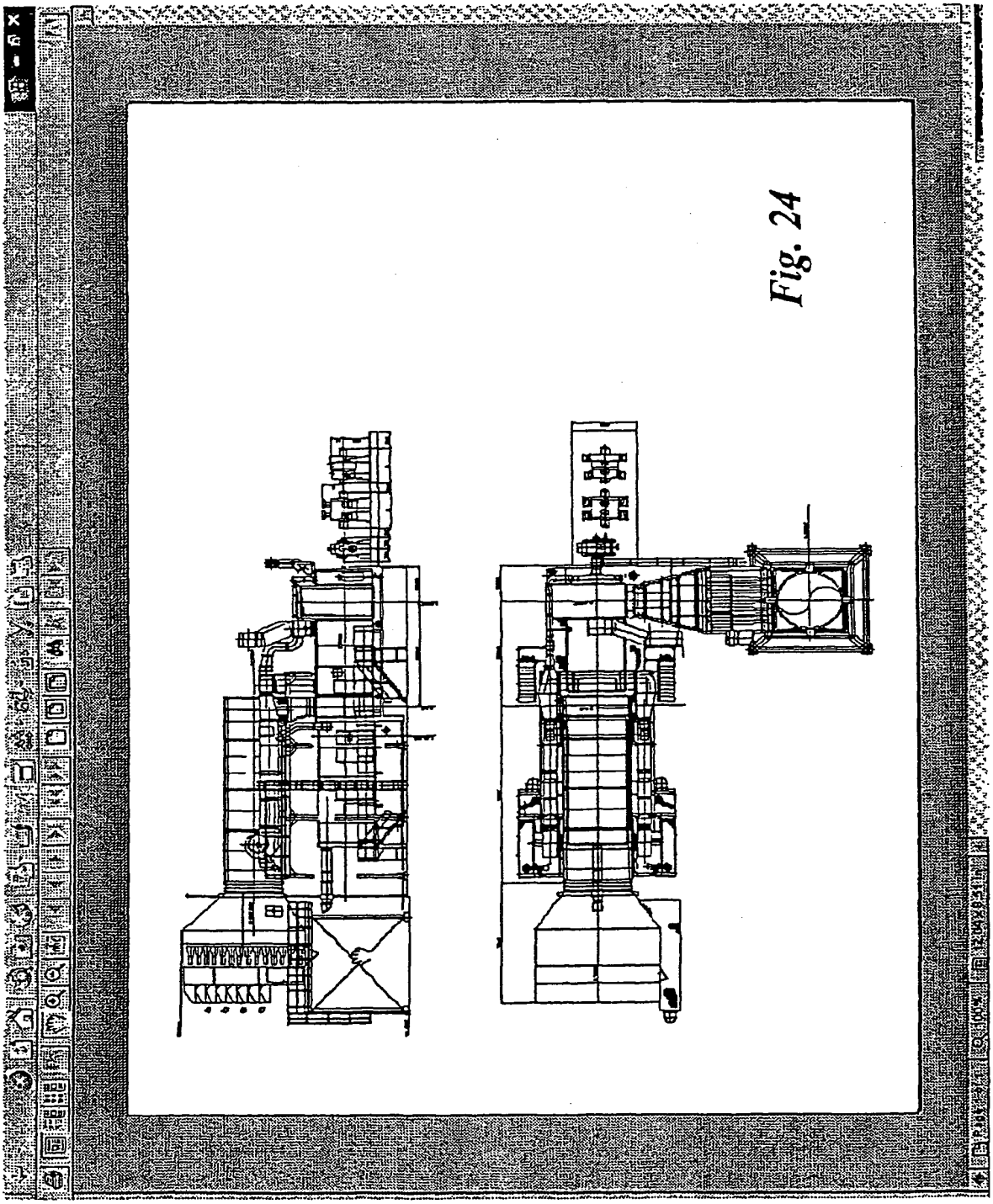

Fig. 24

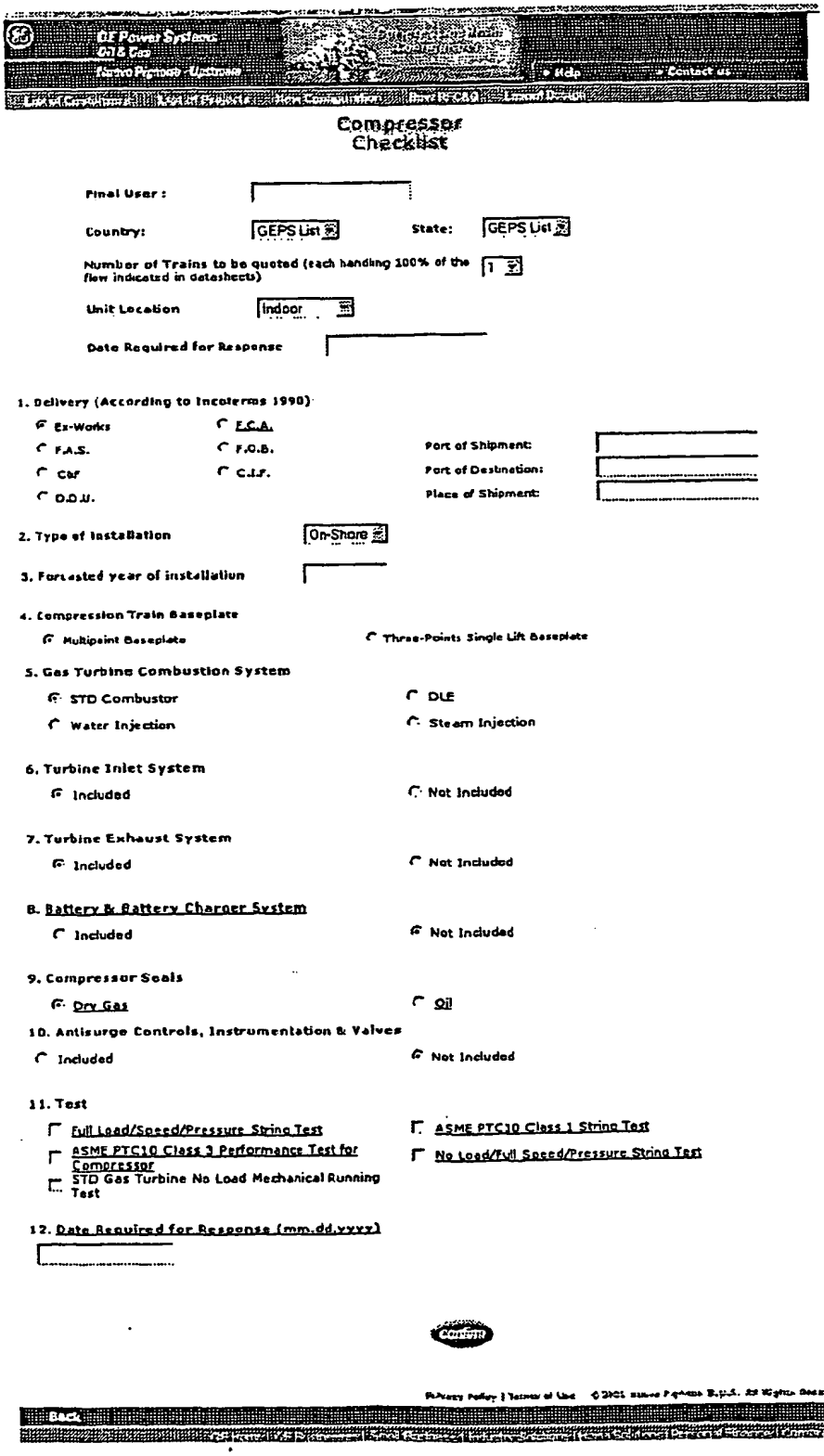
GE Power Systems
Oil & Gas
Help
Contact us
Compressor Checklist
Final User :
Country:
GEPS List
State:
GEPS List
Number of Trains to be quoted (each handling 100% of the flow indicated in datasheets)
1
Unit Location
Indoor
Date Required for Response
1. Delivery (According to Incoterms 1990)
Ex-Works
F.C.A.
F.A.S.
F.O.B.
C&F
C.I.F.
D.D.U.
Port of Shipment:
Port of Destination:
Place of Shipment:
2. Type of Installation
On-Shore
3. Forecasted year of installation
4. Compression Train Baseplate
Multipoint Baseplate
Three-Points Single Lift Baseplate
5. Gas Turbine Combustion System
STD Combustor
DLE
Water Injection
Steam Injection
6. Turbine Inlet System
Included
Not Included
7. Turbine Exhaust System
Included
Not Included
8. Battery & Battery Charger System
Included
Not Included
9. Compressor Seals
Dry Gas
Oil
10. Antisurge Controls, Instrumentation & Valves
Included
Not Included
11. Test
Full Load/Speed/Pressure String Test
ASME PTC10 Class 1 String Test
ASME PTC10 Class 3 Performance Test for Compressor
No Load/Full Speed/Pressure String Test
STD Gas Turbine No Load Mechanical Running Test
12. Date Required for Response (mm.dd.yyyy)
Back

Fig. 25

Electric Motor Checklist

Final User :

Country: GEPS List State: GEPS List

Number of Trains to be quoted (each handling 100% of the flow indicated in datasheets) 1

Unit Location Indoor

Date Required for Response

1. Delivery (According to Incoterms 1990)

- (•) Ex-Works
- ( ) F.C.A.
- ( ) F.A.S.
- ( ) F.O.B.
- ( ) C&F
- ( ) C.I.F.
- ( ) D.D.U.

Port of Shipment:
Port of Destination:
Place of Shipment:

2. Type of Installation On-Shore

3. Forecasted year of installation

4. Compression Train Baseplate

- (•) Separate Multipoint Baseplate for Driver and Compressor
- ( ) Common Multipoints Baseplate

5. Gas Turbine Combustion System

- (•) STD Combustor
- ( ) DLE
- ( ) Water Injection
- ( ) Steam Injection

6. Turbine Inlet System

- (•) Included
- ( ) Not Included

7. Turbine Exhaust System

- (•) Included
- ( ) Not Included

8. Battery & Battery Charger System

- ( ) Included
- (•) Not Included

9. Compressor Seals

- (•) Dry Gas
- ( ) Oil

10. Antisurge Controls, Instrumentation & Valves

- ( ) Included
- (•) Not Included

11. Test

- [ ] Full Load/Speed/Pressure String Test
- [ ] ASME PTC10 Class 1 String Test
- [ ] ASME PTC10 Class 3 Performance Test for Compressor
- [ ] No Load/Full Speed/Pressure String Test
- [ ] STD Gas Turbine No Load Mechanical Running Test

12. Date Required for Response (mm.dd.yyyy)

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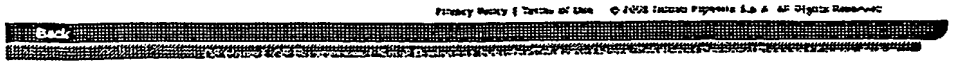

Fig. 26

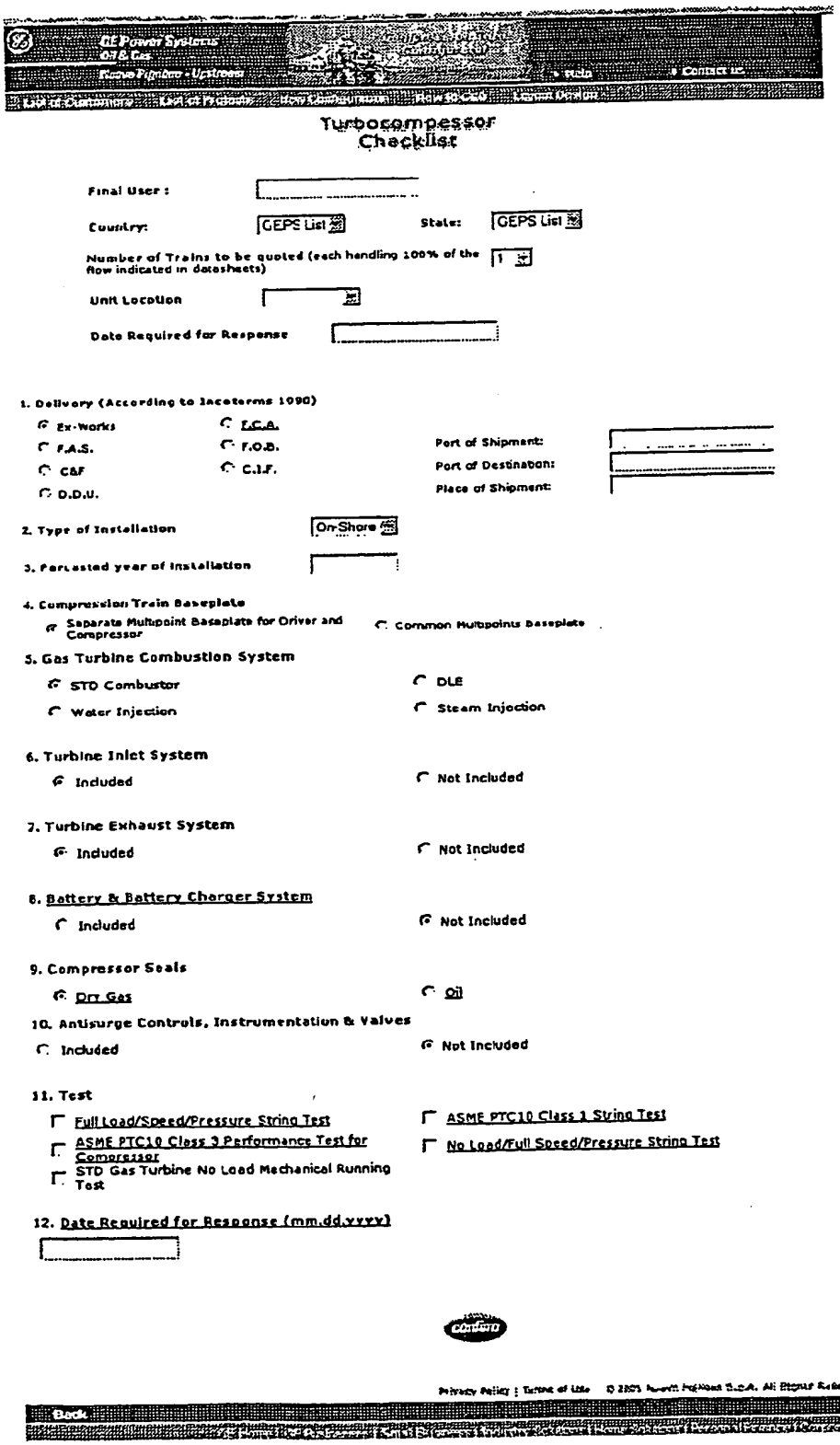
GE Power Systems
Oil & Gas
Turbocompressor
Checklist
Final User :
Country:
GEPS List
State:
GEPS List
Number of Trains to be quoted (each handling 100% of the flow indicated in datasheets)
1
Unit Location
Date Required for Response
1. Delivery (According to Incoterms 1990)
Ex-Works
F.C.A.
F.A.S.
F.O.B.
C&F
C.I.F.
D.D.U.
Port of Shipment:
Port of Destination:
Place of Shipment:
2. Type of Installation
On-Shore
3. Forecasted year of installation
4. Compression Train Baseplate
Separate Multipoint Baseplate for Driver and Compressor
Common Multipoints Baseplate
5. Gas Turbine Combustion System
STD Combustor
DLE
Water Injection
Steam Injection
6. Turbine Inlet System
Included
Not Included
7. Turbine Exhaust System
Included
Not Included
8. Battery & Battery Charger System
Included
Not Included
9. Compressor Seals
Dry Gas
Oil
10. Antisurge Controls, Instrumentation & Valves
Included
Not Included
11. Test
Full Load/Speed/Pressure String Test
ASME PTC10 Class 1 String Test
ASME PTC10 Class 3 Performance Test for Compressor
No Load/Full Speed/Pressure String Test
STD Gas Turbine No Load Mechanical Running Test
12. Date Required for Response (mm.dd.yyyy)
Privacy Policy | Terms of Use
Back

Fig. 27

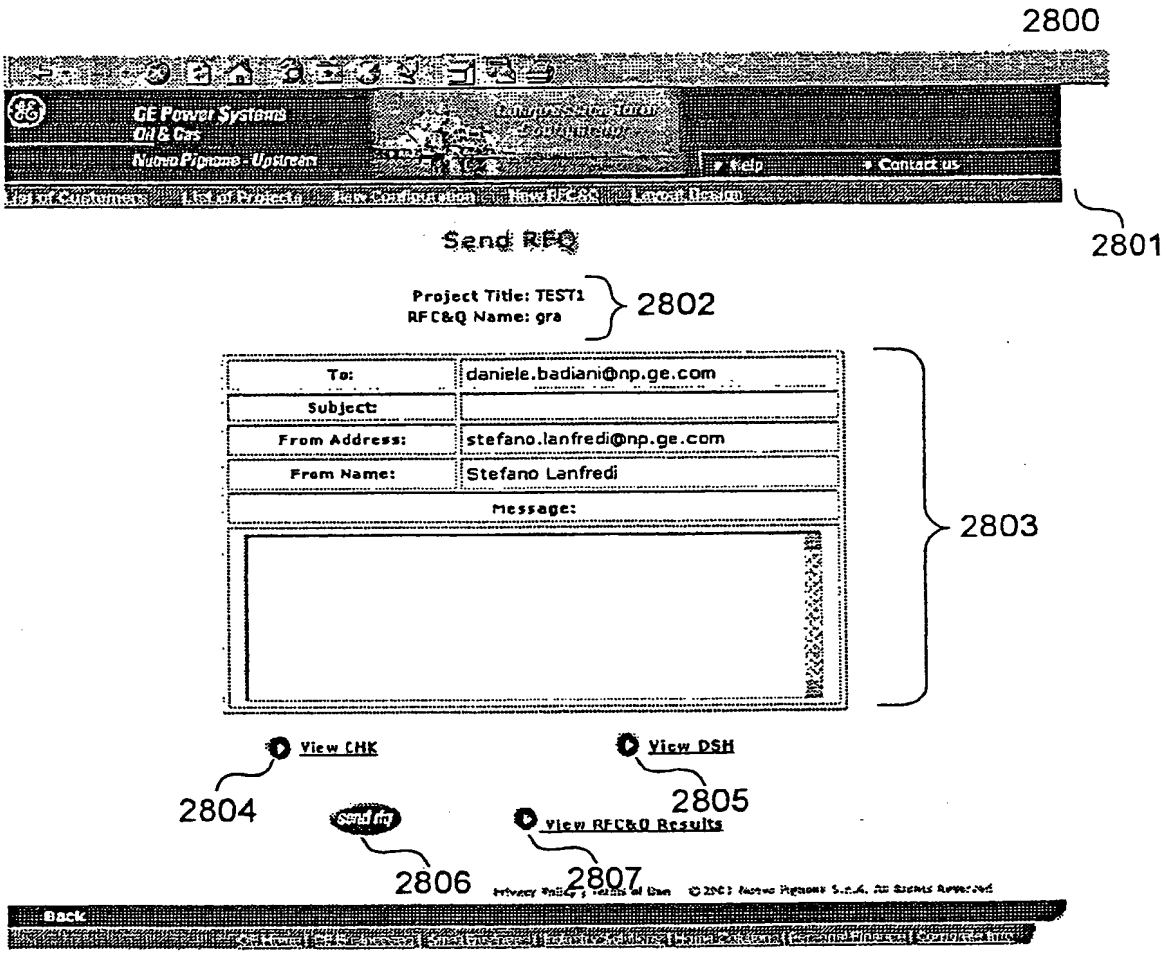
2800
GE Power Systems
Oil & Gas
Nuovo Pignone - Upstream
Help
Contact us
2801
Send RFQ
Project Title: TEST1
RFC&Q Name: gra
2802
To:
daniele.badiani@np.ge.com
Subject:
From Address:
stefano.lanfredi@np.ge.com
From Name:
Stefano Lanfredi
Message:
2803
View CHK
View DSH
2804
2805
Send Inq
View RFC&Q Results
2806
2807
Back

Fig. 28

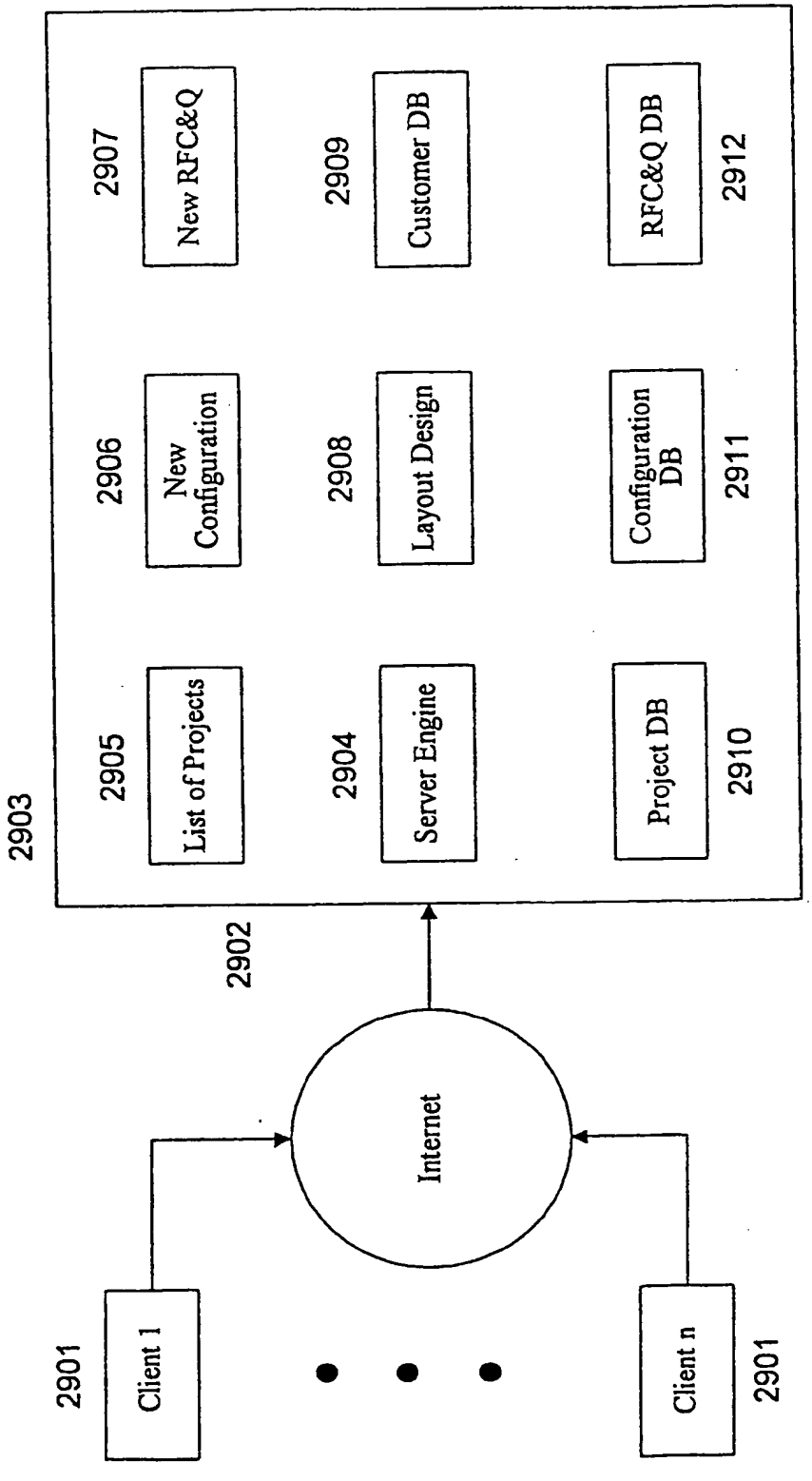
2903
2905
List of Projects
2904
Server Engine
Project DB
2910
2906
New Configuration
2908
Layout Design
Configuration DB
2911
2907
New RFC&Q
2909
Customer DB
RFC&Q DB
2912
2902
Internet
2901
Client 1
Client n
2901

Fig. 29

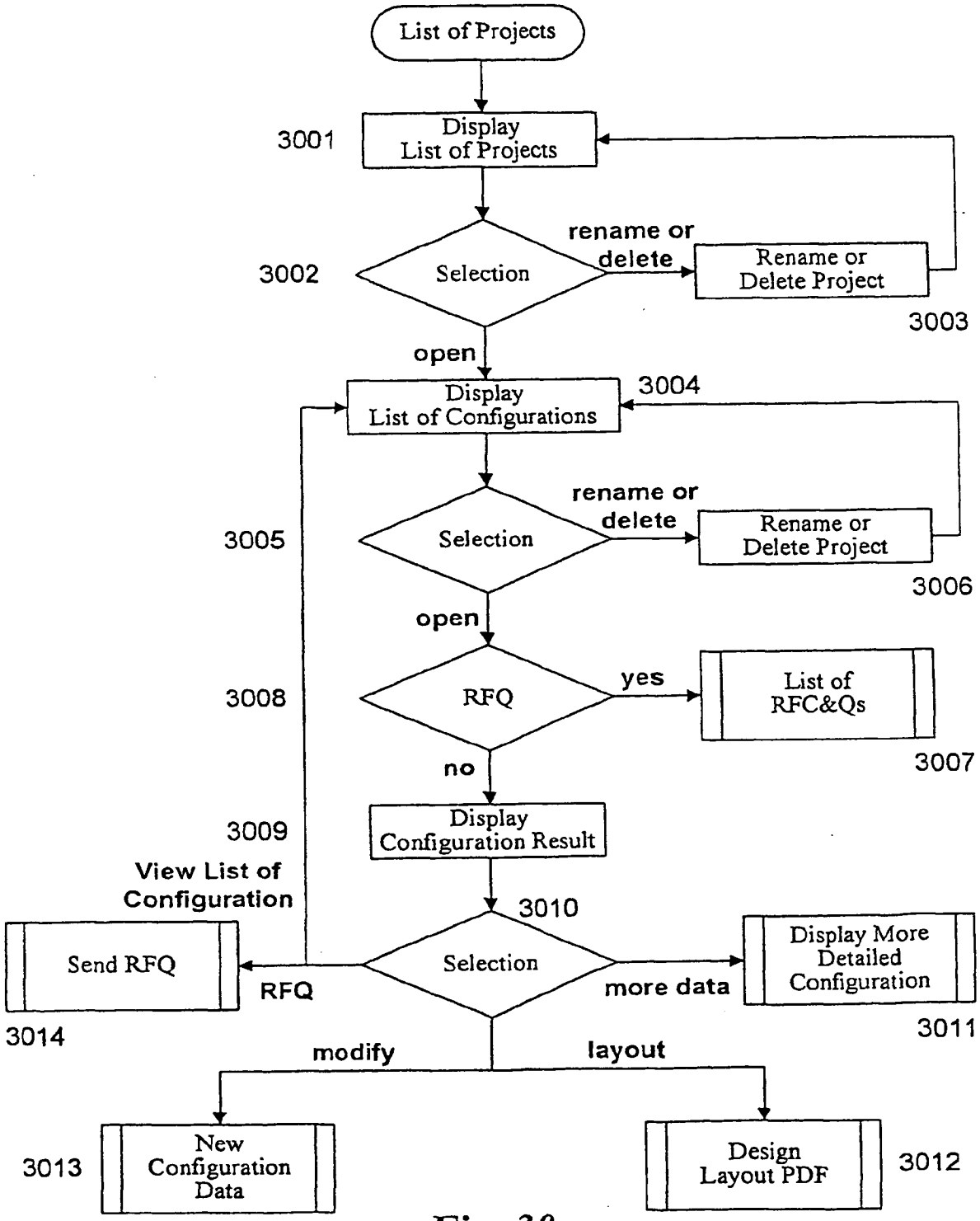
List of Projects
3001
Display List of Projects
3002
Selection
rename or delete
Rename or Delete Project
3003
open
Display List of Configurations
3004
3005
Selection
rename or delete
Rename or Delete Project
3006
open
3008
RFQ
yes
List of RFC&Qs
3007
no
3009
Display Configuration Result
View List of Configuration
3010
Send RFQ
RFQ
Selection
more data
Display More Detailed Configuration
3011
3014
modify
layout
3013
New Configuration Data
Design Layout PDF
3012

Fig. 30

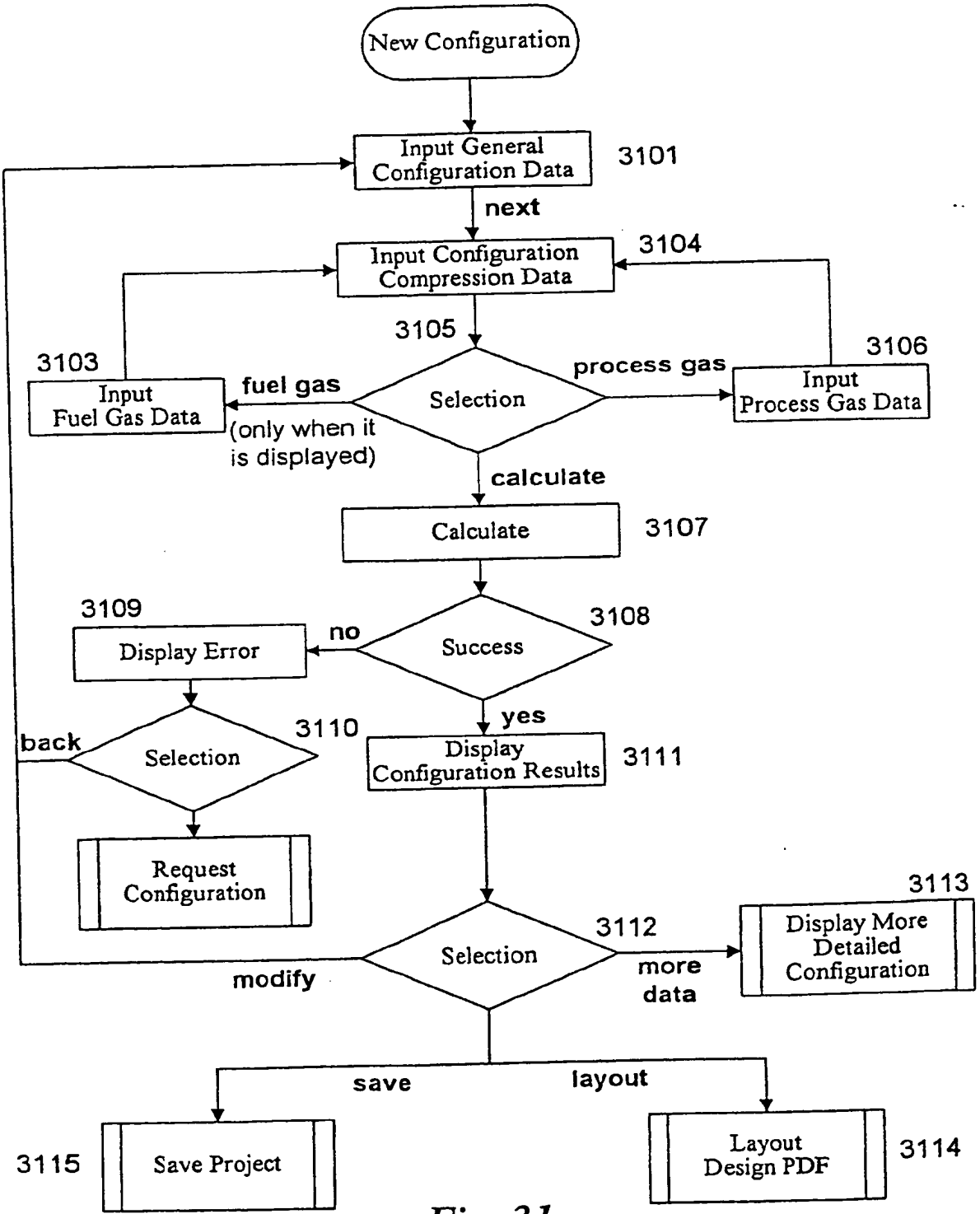
New Configuration
Input General Configuration Data
3101
next
Input Configuration Compression Data
3104
3105
3103
Input Fuel Gas Data
fuel gas
(only when it is displayed)
Selection
process gas
3106
Input Process Gas Data
calculate
Calculate
3107
3109
Display Error
no
Success
3108
yes
back
Selection
3110
Display Configuration Results
3111
Request Configuration
3113
Selection
3112
Display More Detailed Configuration
modify
more data
save
layout
3115
Save Project
Layout Design PDF
3114

Fig. 31

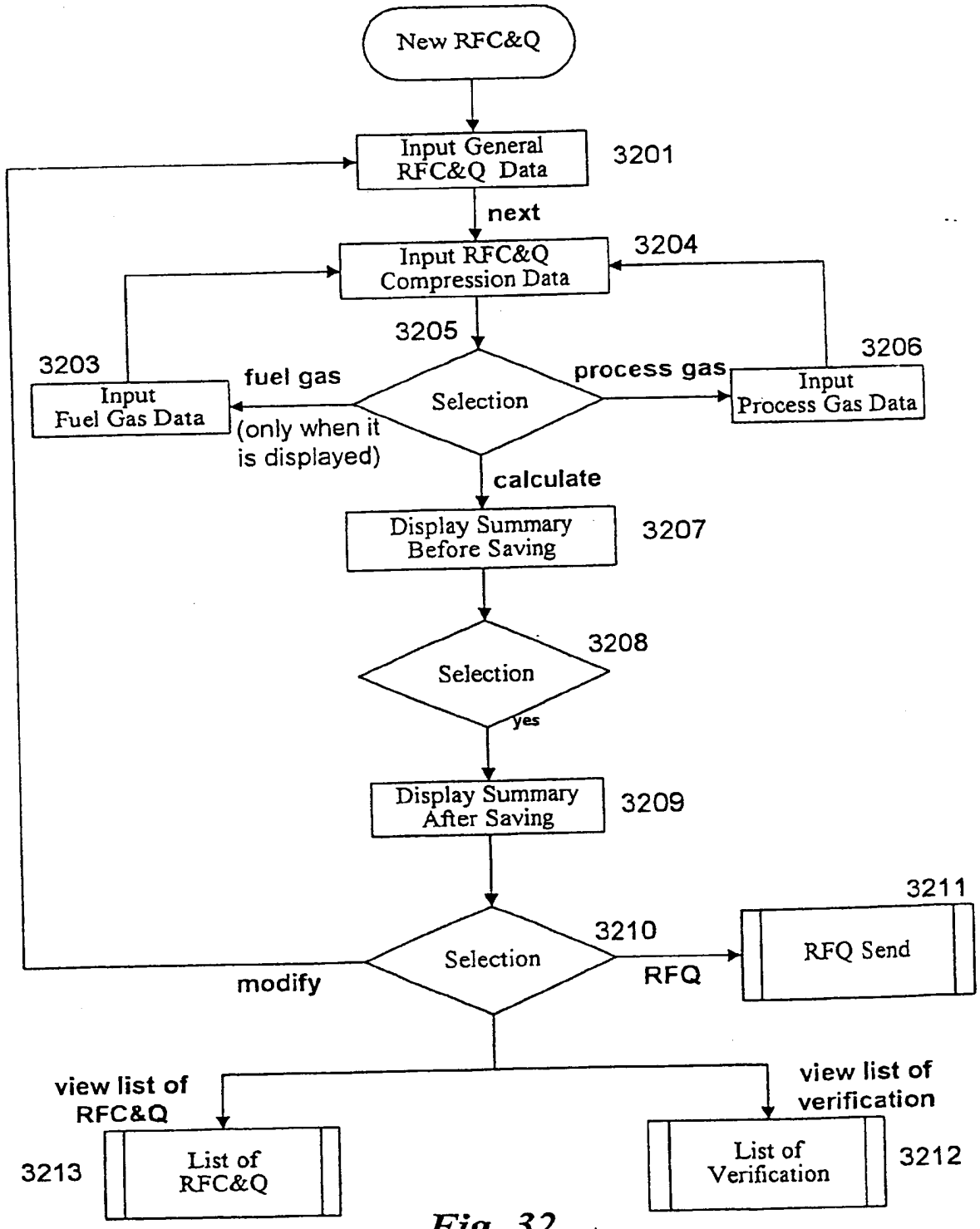
New RFC&Q
Input General RFC&Q Data
3201
next
Input RFC&Q Compression Data
3204
3205
3203
Input Fuel Gas Data
fuel gas
(only when it is displayed)
Selection
process gas
3206
Input Process Gas Data
calculate
Display Summary Before Saving
3207
Selection
3208
yes
Display Summary After Saving
3209
3211
Selection
3210
RFQ
RFQ Send
modify
view list of RFC&Q
3213
List of RFC&Q
view list of verification
List of Verification
3212

Fig. 32

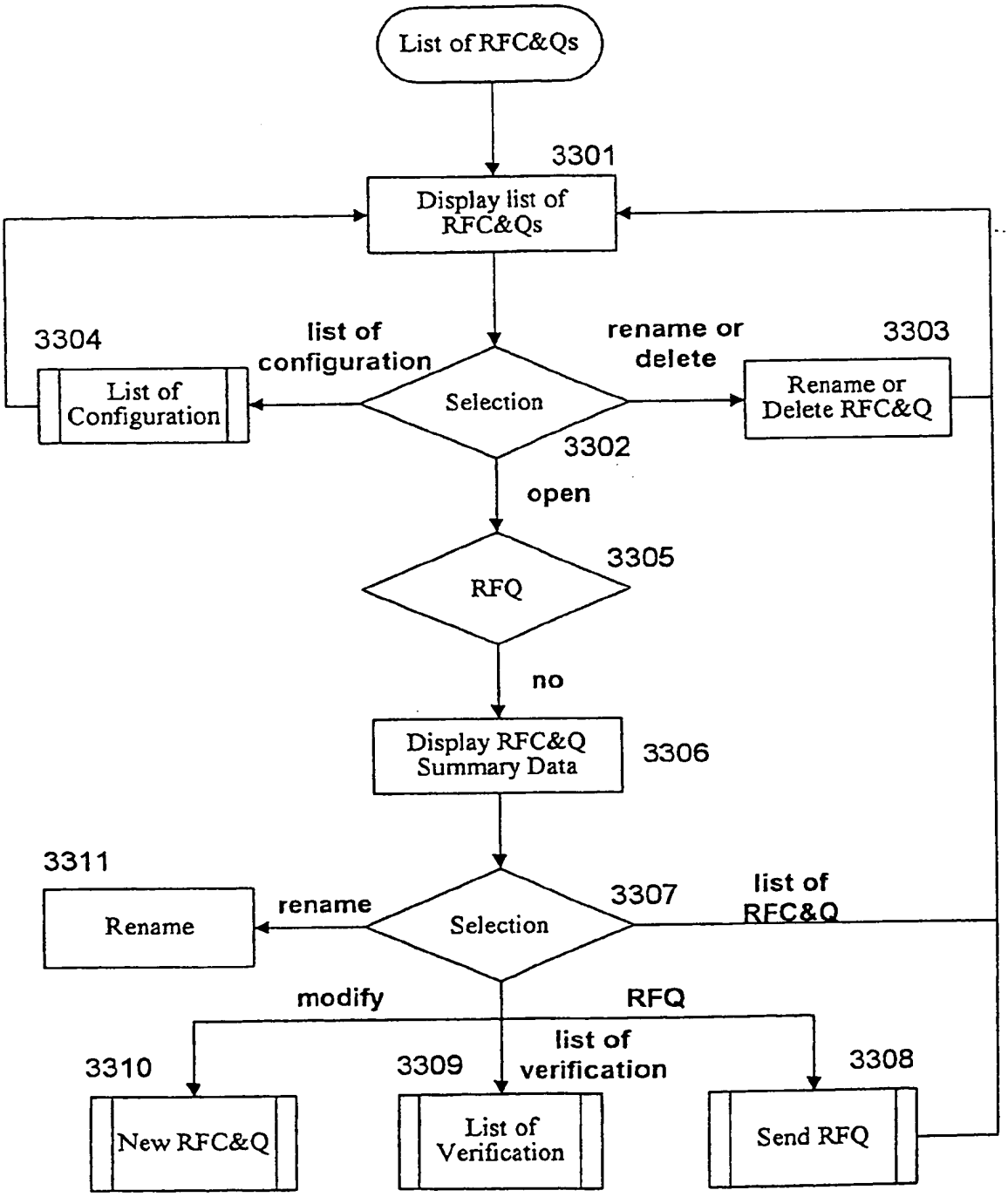
List of RFC&Qs
3301
Display list of RFC&Qs
3304
list of configuration
rename or delete
3303
List of Configuration
Selection
Rename or Delete RFC&Q
3302
open
3305
RFQ
no
Display RFC&Q Summary Data
3306
3311
Rename
rename
Selection
3307
list of RFC&Q
modify
RFQ
list of verification
3310
3309
3308
New RFC&Q
List of Verification
Send RFQ

Fig. 33

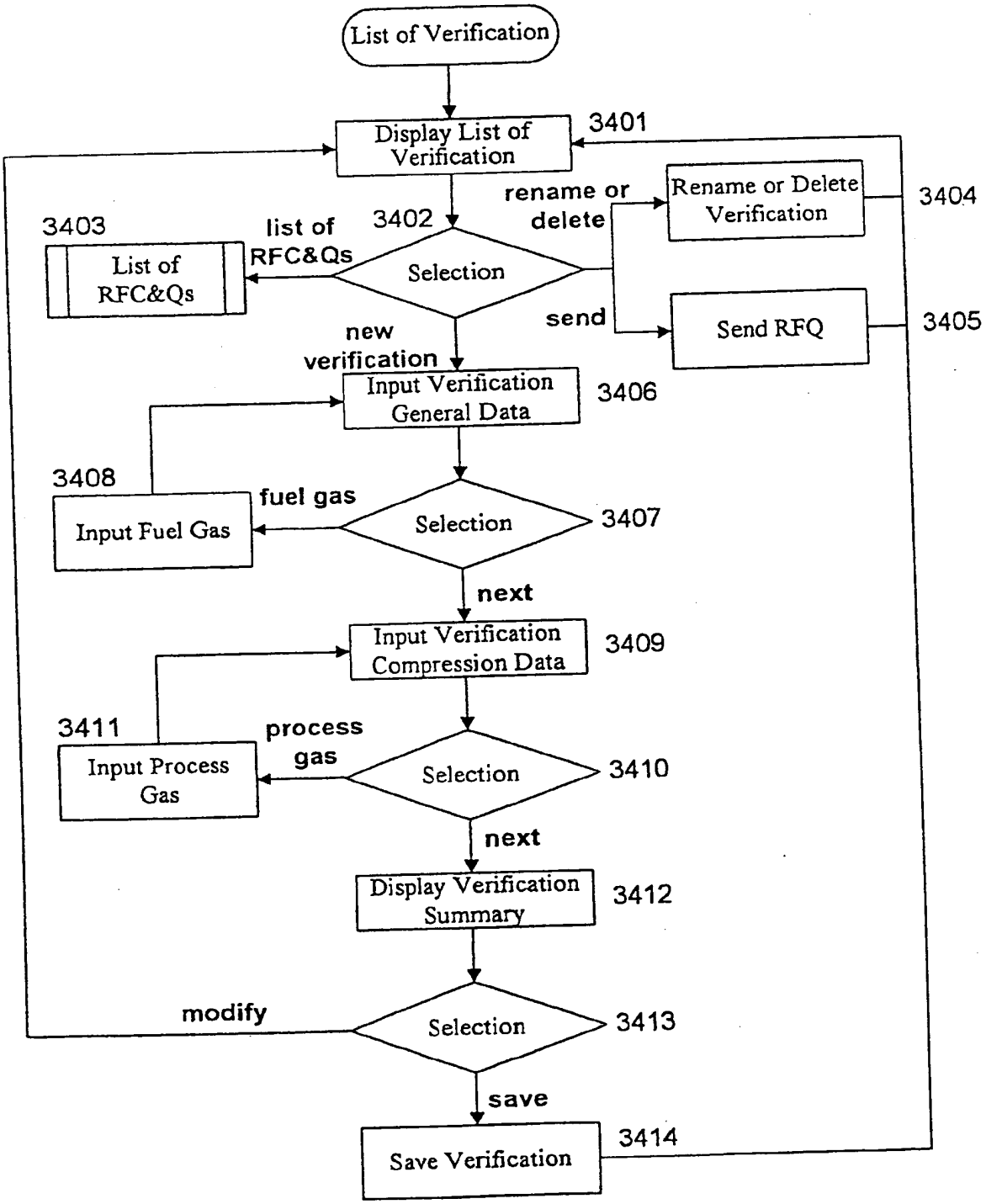
List of Verification
Display List of Verification
3401
rename or delete
Rename or Delete Verification
3404
3403
list of RFC&Qs
3402
List of RFC&Qs
Selection
send
Send RFQ
3405
new verification
Input Verification General Data
3406
3408
fuel gas
Input Fuel Gas
Selection
3407
next
Input Verification Compression Data
3409
3411
process gas
Input Process Gas
Selection
3410
next
Display Verification Summary
3412
modify
Selection
3413
save
Save Verification
3414

Fig. 34

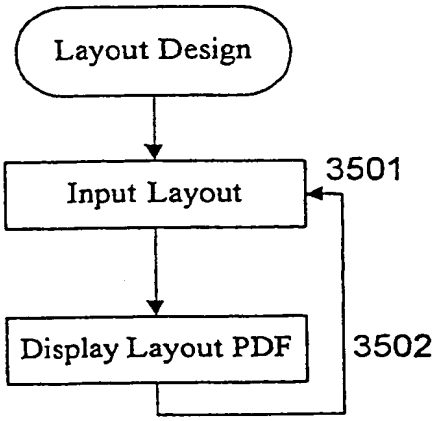

Fig. 35

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 229 479 A3

(12) EUROPEAN PATENT APPLICATION

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08.01.2003 Bulletin 2003/02

(43) Date of publication A2:
07.08.2002 Bulletin 2002/32

(21) Application number: **02250598.6**

(22) Date of filing: **29.01.2002**

(51) Int Cl.[7]: **G06F 17/60**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **01.02.2001 US 776238**

(71) Applicant: **Nuovo Pignone Holding S.P.A.**
50127 Florence (IT)

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- **Lanfredi, Stefano**
  50123 Firenze (IT)
- **Castaldi, Andrea**
  Florence (IT)
- **Quaranta, Christina**
  Florence (IT)

(74) Representative: **Pedder, James Cuthbert**
GE London Patent Operation,
Essex House,
12/13 Essex Street
London WC2R 3AA (GB)

(54) Presentation system for compression train configuration information

(57) A method and system for collecting operating conditions of a compression train from the potential purchaser, for presenting a compression train that satisfies those operating conditions, and for receiving a request for quotation for the presented compression train. The presentation system is implemented using a client/server architecture. The server system provides to the client systems display pages of compression train-related information. These display pages allow users of the client systems to input desired operating conditions of the compression train. When the server system receives these operating conditions from client systems, it provides these operating conditions to a calculation engine to identify a compression train that satisfies the operating conditions. The identified compression train includes the identification of the driver target, gearbox, and one or more compression casings along with various characteristics of the configuration such as discharge pressure, discharge temperature, and number of stages.

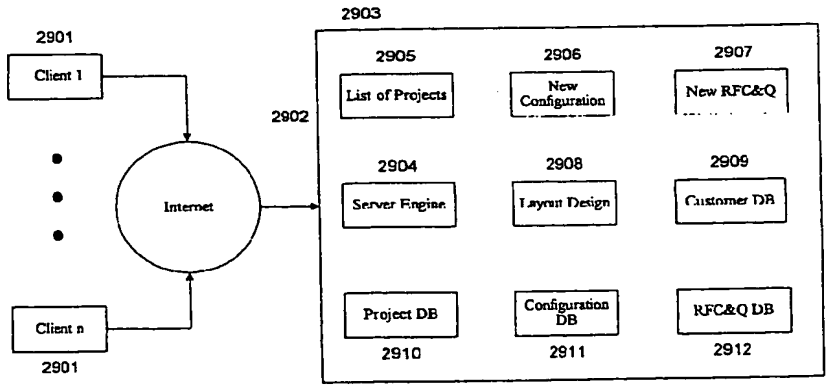

Fig. 29

EP 1 229 479 A3

European Patent Office

DECLARATION

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 02 25 0598

The Search Division considers that the present application, does not comply with the provisions of the EPC to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of all claims

Reason:

A meaningful search is not possible on the basis of all claims because all claims are directed to - Scheme, rules and method for doing business - Article 52 (2)(c) EPC -

The claims relate to subject-matter excluded from patentability under Article 52(2) and (3) EPC. Given that the claims are formulated in terms of such subject matter or merely specify commonplace features relating to its technological implementation, the search examiner could not establish any technical problem which might potentially have required an inventive step to overcome. Hence it was not possible to carry out a meaningful search into the state of the art (Rule 45 EPC; see also Guidelines for Examination in the EPO, Part B, Chapter VIII, 1-6).

The applicant's attention is drawn to the fact that a search may be carried out during examination following a declaration of no search under Rule 45 EPC, should the problems which led to the declaration being issued be overcome (see EPC Guideline C-VI, 8.5).

CLASSIFICATION OF THE APPLICATION (Int.Cl.7)

G06F17/60

Place of search	Date	Examiner
MUNICH	12 November 2002	Beatty, J

EPO FORM 1504 (P04C37)